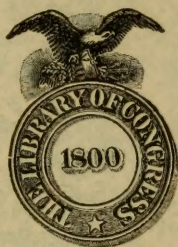


THE PRACTICE  
OF  
VETERINARY SURGERY

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H. L. SCHUH, D.V.M.





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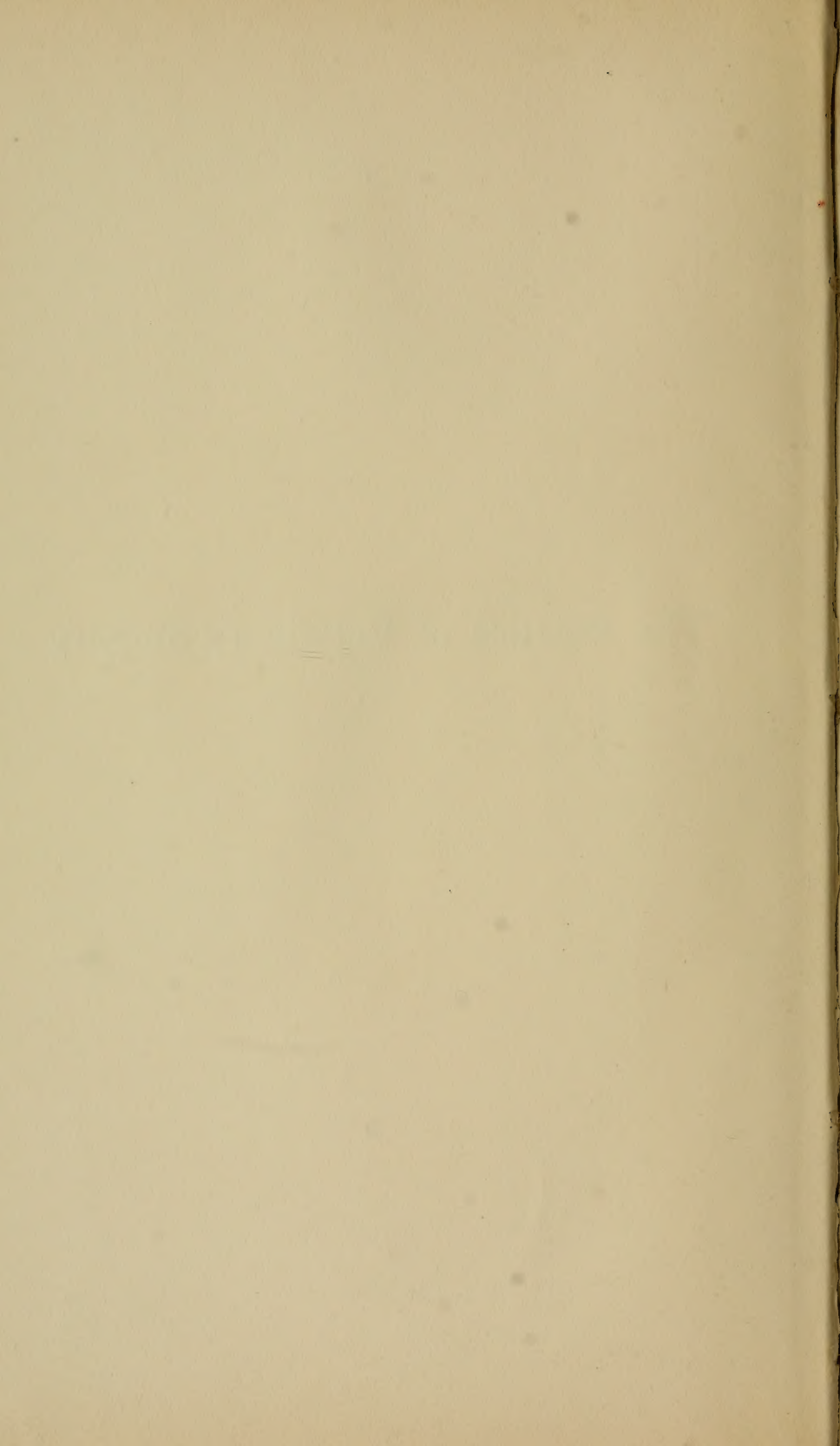






# The Practice of Veterinary Surgery







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*The Basis of a Series of Lectures Delivered to  
the Seniors of the Grand Rapids  
Veterinary College*

By H. L. Schuh, D. V. M.



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# CHAPTER I

## DISEASES OF THE EYE

### DISEASES OF THE ORBIT

#### Retro-Bulbary Phlegmon

**R**ETRO-BULBARY PHLEGMON is a condition in which the tissues surrounding the eyeball becomes involved in the formation of a phlegmon, which frequently results in the formation of an abscess.

• **Cause**—The causes of this condition are either primary or secondary. The most important primary or direct cause is injuries or wounds, with or without infection. Secondary causes would be the spreading of an inflammatory condition, or an infectious process by continuity, from the surrounding tissues.

**Forms**—This condition appears in two forms depending upon the presence or absence of infection. The forms therefore would be septic and aseptic.

**Symptoms**—The symptoms of both forms appear about the same clinically. The eyelids and the tissues surrounding the eyeball become swollen and oedematous. This swelling is hot, painful, and shows all of the symptoms of an acute inflammatory condition. This swollen condition frequently becomes so severe that the lids are nearly shut and the mucous membrane of the lid becomes inverted, so that it shows itself very distinctly between the edges of the lids. When this condition affects the fatty cushion of the eye, it causes the eyeball to be protruded from the orbital

fossa. On examination of the conjunctiva it is found to be reddened, sensitive and swollen.

In the septic form of this disease, symptoms of abscess formation are noticed in this region. After a few days such general symptoms as rapid pulse, an elevation of temperature and the animal refusing food will be noted. All of the symptoms presented by the animal are more severe in this form.

Rarely does the abscess evacuate spontaneously without very severe symptoms. After the contents of the abscess are evacuated healing takes place by second intention and the symptoms gradually disappear. It may occur that the abscess points inwardly instead of pointing toward the outside of the body, in which case death results from meningitis and pyemia.

**Course**—The course of this condition is usually acute, but may run a course of several weeks.

**Treatment**—The treatment depends upon the form of the disease existing. In the aseptic form, moist warmth in the form of hot packs, antiphlogistics, or poultices, are the most effectual. If it is not practicable to apply moist warmth antiseptic ointments and lotions may be applied with massage; as boric acid ointment, ichthyol ointment, iodine ointment, etc.

In the septic form, open the abscess as early as possible. Give drainage and disinfect with some non-toxic, non-irritating antiseptic, as potassium permanganate, boric acid, etc. Internal treatment is of very little value.

## WOUNDS OF THE EYELIDS

In the horse, lacerated wounds of the eyelid occur very frequently. This condition is seen in other animals but is less common. Other wounds seen on and in the region of



the lid are bruises, contusions and decubitus as the result of traumatic injuries from being cast, etc. It is not uncommon to have septicaemia, following the last named injuries.

In treating lacerated wounds of the lids, great care must be exercised, for in suturing the act of puncturing the skin with the needle causes the animal to jerk or move the head, and if care is not exercised there is some danger of puncturing the eyeball.

It is not advisable to remove any apparent excessive tissue from flap wounds of the lids, as these wounds heal with remarkable rapidity and very rarely leave any unsightly eschar, owing to their great power of regeneration.

If these wounds give rise to a severe inflammation of the subcutaneous tissue they may be treated with a hot antiseptic pack, antiphlogistine, boric acid ointment, etc.

If the tissues in the region of the lids are contused the treatment should consist of antiseptic lotion as a two per cent boric acid solution, one per cent solution of alum, one-half per cent solution of acetic acid or a one per cent solution of potassium permanganate. These solutions seem to be more effective when applied warm, and from fifteen to twenty minutes at each application.

## BLEPHARITIS

### Inflammation of the Eyelids

Blepharitis is an inflammation of the eyelids. Clinically it appears in two forms, superficial and deep. Superficial blepharitis occurs most commonly and is an inflammation of the skin covering the lid. It is due chiefly to dermatitis, eczema, and mild irritations. A deep blepharitis effects the deeper structures of the lid and is most commonly caused by phlegmons, which appear as a wound infectious disease, following bites, punctured wounds, necrosis and abscess

formations. A necrotic condition of the lids may be caused by suppurative lachrymosis, decubitus, pressure necrosis from the halter or bridle, or from rubbing blisters on the lids.

In dogs, blepharitis usually occurs as the result of eczema appearing on the margin of the lids, or from furunculosis appearing in the form of small pustules or cysts.

**Symptoms**—The symptoms of blepharitis vary greatly and the symptoms of the cause predominate; however, the lids become swollen, sensitive and reddened.

**Course**—The course of blepharitis is either acute or chronic.

**Treatment**—Eczematous blepharitis should be treated with antiseptic ointment applied freely with massage, as zinc ointment, ointment of balsam of Peru, ointment of yellow oxide of mercury, ichthyol ointment, etc. If the application of ointment is not practicable, solutions may be used to advantage, as ten per cent solution of calendula, ten per cent solution of balsam of Peru in alcohol, etc.

The treatment of necrosis of the lids consists in extirpating the necrotic area if possible. If this is not possible, cauterize with a five per cent solution of silver nitrate, followed by the application of a ten per cent solution of calendula or some non-irritating coal tar antiseptic.

In furunculosis the pustules should be opened and cauterized with a ten per cent solution of silver nitrate.

Phlegmonous blepharitis should be treated with antiseptic ointments or moist heat applied in the form of hot packs, antiphlogistic preparations or ariol paste.

### Ptosis

Ptosis is a condition in which there is persistent drooping of the upper eyelid. Ptosis very rarely occurs as a primary condition but is usually seen to occur secondarily



to some other disease or as a symptom of a disease. It is most commonly due to swelling or paralysis.

**Forms**—Ptosis appears in two forms and these can be distinguished very readily. They are true and false.

In true ptosis there is a paralysis of the orbicularis oris muscle as well as the other muscles of the lids, while in false ptosis there is a drooping of the lid as a result of swelling.

True ptosis generally appears as a symptom of, or during the course of some other disease, as facial paralysis in the horse, or milk fever in the cow. It is also seen as a symptom of central facial paralysis in dourine.

False or pseudo ptosis consists in a severe swelling or an oedematous infiltration of the lids, causing a mechanical drooping. This is seen as the result of injuries or secondarily to some other disease.

**Treatment**—If ptosis appears as a symptom of or during the course of some other disease, treatment is not indicated, as it will disappear with the disease of which it is a symptom. However, it may occur that ptosis will assume a chronic form, in which case it requires surgical treatment. This consists in the removal of an elliptical piece of skin from the center of the upper lid under the strictest antiseptic conditions. Suture the free edges of the wound and the lid will return to its normal condition. The exact size of this piece of skin to be removed cannot be given, as it depends upon the individual case. It is best to hold up a given amount of skin and see how much is necessary to give results before it is removed. It is essential to have healing by first intention for a successful operation.

### Entropium

Entropium is a change in the condition of the eyelid in which the outer border of the lid turns toward the cornea

and the hairs on the free border of the lid come in direct contact with the cornea and conjunctiva.

**Occurrence**—This condition is seen to occur most commonly in young animals, as the pup and colt. It may occur in animals of any age. One or both lids may be affected, although the upper lid is affected most frequently.

**Cause**—The most common cause producing this condition is chronic conjunctivitis. As the result of chronic irritation to the conjunctiva, during chronic conjunctivitis, new connective tissue is produced with an hypertrophy of the muscles of the lid. This new formed connective tissue is cicatricial in character. This eventually contracts with a resulting contortion of the lids. Entropium may also be caused by the muscles of the eye undergoing spasmodic contraction. This is not seen to occur commonly in the horse, but is the most common cause in the dog.

Entropium is also seen to occur at the removal of or following an atrophy of the eyeball. This condition has also been seen to occur as a congenital affection or defect.

**Symptoms**—The edge of the eyelid seems to turn in so that the hairs on the border of the lid irritate the conjunctiva and cornea. As the result of this continual irritation, there appears lachrymosis, photophobia, conjunctivitis, and keratitis. Eventually, after the irritation has become chronic, ulceration of the cornea and chronic keratitis with leucoma formation appear.

**Treatment**—The treatment of this condition is operative and consists in removing an elliptical piece of skin from the center of the lid as in ptosis. If both lids are affected, the operation must be performed on both lids. The pieces of skin must be removed under the strictest antiseptic precautions. When the free edges of the wound are sutured, the lid will return to its normal condition.



After the operation the conjunctivitis and keratitis should be treated with yellow oxide of mercury ointment, ichthyol ointment, warm boric solution, four per cent, etc.

### Ectropium

Ectropium is a condition in which the free border of the eyelid is turned outward. From a veterinary standpoint, this is a very unimportant condition as it very rarely occurs in practice. If it does occur it is seen in older animals and chiefly then in the dog, rarely in the horse.

**Cause**—Ectropium is sometimes congenital, but usually follows conjunctivitis in which the conjunctiva is left greatly thickened, or there is an increased amount causing mechanical ectropium.

**Treatment**—The treatment is operative in acquired cases and expectative in congenital cases. If the conjunctiva is greatly thickened or increased in amount, it may be excised and treated with warm boric acid solution. If this does not give the desired results, remove an elliptical piece of skin, about one-half an inch from the canthi. When the free edges of the skin are sutured, it will have a tendency to draw the lids to their normal condition. Healing by first intention is essential.

## DISEASES OF THE CONJUNCTIVA

### Catarrhal Conjunctivitis

Catarrhal conjunctivitis consists in a superficial inflammation of the conjunctiva, with the formation of a catarrhal or serous exude. This form of conjunctivitis appears in all animals. It may appear as a primary disease or as a symptom of some other disease.

**Cause**—The most common causes of catarrhal conjunctivitis appearing as a primary disease, are direct irritations by mechanical means, as splinters, briars, hayseed, hair, dust, grain, pollen, or by chemical agents as alcohol, bichloride, rubbing blisters, etc., or by thermic agents as burning, extremely hot weather, freezing, etc. While these are the most common causes, it may also be due to parasites. When it is parasitic in origin it is unilateral, otherwise it appears as a bilateral affection.

Catarrhal conjunctivitis occurs as a symptom during the course of some contagious and infectious disease, as dog distemper, contagious pleuro-pneumonia, contagious corhyza, influenza, periodical ophthalmia, malignant head catarrh, etc. In dogs, the disease sometimes appears in old age and does not seem to have any specific cause.

**Symptoms**—The symptoms of catarrhal conjunctivitis appear with a serous or watery discharge from the eyes, the animal keeps the lids closed as the presence of light seems to be very irritating. The conjunctiva is swollen, reddened and painful on pressure. The conjunctiva frequently becomes so greatly swollen that it is visible between the lids. As the disease progresses the discharge becomes admixed with mucus.

**Treatment**—The treatment consists in the application of mild astringent washes to the conjunctiva, as one per cent solution of alum, two per cent solution of boric acid, one per cent solution of zinc sulphate, or ichthyol. If the conjunctiva is hyper-sensitive, a few drops of a four per cent solution of cocaine may be dropped directly into the conjunctival sack. In the earlier stages of this disease a few drops of adrenalin solution (1/10,000) will be found very useful in allaying the congestion.



### Purulent Conjunctivitis

Purulent conjunctivitis is a suppurative inflammation of the conjunctiva as the result of infection.

**Cause**—The most common cause of purulent conjunctivitis is an infection of the conjunctiva with ordinary pus cocci, or it may be due to a specific infection as in dog distemper, or malignant head catarrh.

The entrance of the infection to the conjunctiva may take place in various ways as by mechanical means, by rubbing, or by the entrance of a foreign body into the conjunctival sack, etc.

Purulent conjunctivitis may occur as the result of the entrance of a foreign body, but this is not common in practice. If due to a foreign body in the conjunctival sack, it appears as a unilateral affection.

**Symptoms**—The symptoms of purulent conjunctivitis appear with a purulent or suppurative discharge from the eyes, scabs, or crusts form on the edge of the lids, sometimes causing the lids to be pasted together. The conjunctiva is very pale. This constitutes a diagnostic symptom. After this disease has existed for some time, the suppurative process spreads to the lids and cornea, giving rise to eczema or furunculosis and keratitis.

**Course**—The course of this disease is usually long drawn out, assuming a chronic form.

**Treatment**—The treatment consists of applying antiseptic solutions and ointments to the conjunctival sack, as chinosol (1/1000), one per cent solution of ichthyol, one-half per cent solution of cresol, one per cent solution of copper sulphate or zinc sulphate, yellow oxide of mercury ointment, etc. Before treatment is administered it is very essential to examine the conjunctival sack for the presence of a

foreign body. This is especially true of unilateral purulent conjunctivitis.

### Parenchymatous Conjunctivitis

Parenchymatous conjunctivitis is an inflammation of the entire structure of the conjunctiva, especially the deeper layers. It consists in a severe traumatic or infectious inflammatory process.

**Occurrence**—It appears as a primary disease from the spreading of an inflammatory process by continuity, or as a symptom of some other disease.

If due to infection, the infection enters the deeper structures by way of the blood or lymph stream. In these cases it generally appears as the symptom of some other disease.

**Symptoms**—The chief and diagnostic symptom is a very firm, glassy swelling of the conjunctiva. After a few days the inflammatory process spreads, involving the sclera. There is a serous or sero mucous discharge from the eye. In exceptional cases the discharge becomes purulent.

**Course**—The course of this disease is acute. If healing does not take place promptly the conjunctiva becomes necrotic.

**Treatment**—The treatment consists in the application of cooling antiseptic astringent washes, as one per cent solution of alum, etc. If the swelling of the conjunctiva becomes severe, it becomes necessary to scarify the superficial layers.

### Follicular Conjunctivitis

Follicular conjunctivitis consists in a severe chronic swelling of the lymph follicles and connective tissue on the inner surface of the membrana nictitans.

This disease is seen to occur mostly in dogs, but may appear in any animal.

**Cause**—The exact cause is unknown.

**Symptoms**—The membrana nictitans becomes red and swollen. By examining it after the disease has existed for some time, there will be found small dark red ulcerations on the inner surface. These ulcerations later on become confluent, forming distinct nodules. The membrane nictitans protrudes from the inner canthus, resembling somewhat a small tumefaction. There is rarely any discharge from the eye affected.

This condition may spread to the conjunctiva by continuity, in which case it leads to cicatrization with the formation of entropium.

**Course**—The course of this disease is chronic.

**Treatment**—The most satisfactory treatment consists in removing the entire membrana nictitans. Grasp the membrane with an artery forcep, or small vulsellum forcep, draw it out as far as possible and remove with the scissors. The entire membrane must be removed to give the desired results. Other forms of treatment consist in cauterization with a five per cent solution of silver nitrate, immediately followed with salme solution. This form of treatment is not very satisfactory, from a clinical point of view. After removing the membrana nictitans instill five to ten drops of warm boric acid solution into the eye three times daily. If the conjunctiva is involved, place a small amount of yellow oxide of mercury ointment directly between the lids.

## DISEASES OF THE LACHRYMAL APPARATUS

The only disease of the lachrymal apparatus that is of clinical importance is a catarrhal condition of the lachrymal sack and duct. This consists in a chronic catarrhal in-



flammation, caused by a stricture or stoppage of the naso-lachrymal duct.

**Symptoms**—The symptoms of catarrh of the lachrymal sack consists in the flowing of tears over the face instead of through the naso-lachrymal duct. This irritates the conjunctiva, and after the disease exists some time, conjunctivitis appears, which is acute in character.

**Course**—The course of this disease is chronic.

**Treatment**—The treatment consists in irrigating the lachrymal sack, through the naso-lachrymal duct, with mild antiseptic astringents, as zinc sulphate one per cent, alum two per cent, etc. This irrigation can be carried out with a small syringe, or a bulb syringe, through the nasal opening of the naso-lachrymal duct.

## DISEASES OF THE CORNEA

### Keratitis

Diseases of the cornea are divided into suppurative and non-suppurative, from a clinical point of view; however, there may be another division according to the part of the cornea affected, that is superficial, parenchymatous and posterior keratitis.

#### Superficial Keratitis

Superficial keratitis is an inflammation of and involves the superficial portion of the cornea and the reflection of the conjunctiva over the cornea.

**Cause**—The chief causes are mechanical irritations from external sources, which either comes directly in contact with the cornea or lodges between the folds of the conjunctiva, thus irritating the cornea. This disease has been known to

occur by metastasis, but is extremely rare, in which case it is suppurative in character.

**Forms**—Superficial keratitis appears in two forms, catarrhal and suppurative.

**Symptoms**—The symptoms of superficial catarrhal keratitis consist in swelling of the cornea with desquamation of the epithelium. The cornea is rough and opaque in appearance, and there is a catarrhal discharge from the eyes. This form of keratitis is most commonly seen in practice.

In superficial purulent keratitis the surface of the cornea is yellow and roughened. In some cases the entire cornea does not become yellowish in color, but yellow spots appear over the surface of the cornea. This form of keratitis very rarely appears primarily, but is seen either as the result of or during the course of some other disease.

**Treatment**—The treatment of superficial catarrhal keratitis consists in the use of yellow oxide of mercury ointment, ichthyol ointment or mild astringent antiseptic washes.

In superficial purulent keratitis, yellow oxide of mercury, one per cent solution of chinisol, or eucamphol should be instilled directly into the conjunctival sack.

### Pannus Keratitis

Pannus keratitis is characterized by thickening and roughness of the cornea, with resulting vascularization. The cornea becomes covered with new formed blood vessels, leading from the border to the center, which are visible to the naked eye.

**Cause**—This condition generally results from purulent keratitis, accompanied by ulceration in which there is an attempt on the part of nature to repair by means of granulation. After healing there is left over a cicatrix (leucoma).

**Symptoms**—There are symptoms of photophobia and lachrymosis present in a marked degree. There is also a catarrhal or muco-purulent discharge from the eye. The cornea is rough and contains numerous small visible blood vessels.

**Course**—The course is chronic as a rule.

**Treatment**—The use of red oxide of mercury ointment is very valuable in the treatment of this disease. It should be placed directly into the conjunctival sack. Two per cent solution of quinine sulphate or yellow oxide of mercury ointment may also be used. The value of mild astringents is doubtful in these cases.

### Parenchymatous Keratitis

This is an inflammation of the deeper or interstitial structures of the cornea and involving the true layers of the cornea itself. It consists in a thickening of the cornea from new formed connective tissue along with the entrance of pus cocci, or some specific infection into the cornea.

**Cause**—The cause of this disease is infection. The infection can gain entrance either directly from external sources or indirectly by metastasis.

**Symptoms**—The symptoms are divided into two classes, those that appear in the form of an infiltration and those leading to abscess formation.

In cases of very mild infection there is an infiltration of the cornea causing a diffused or circumscribed opaqueness. This condition is of very short duration, as absorption occurs or abscess formation exists.

An abscess is usually the result of direct infection. An abscess on the cornea presents a yellowish area about the size of a radish seed and very sharply defined. The course of this condition is about one week and terminates either in



absorption with cicatricial formation, or it suppurates, discharges and leaves behind an ulcerating surface.

**Treatment**—The treatment of infiltration of the cornea as the result of infection, consists in using yellow oxide of mercury ointment, while abscesses should be punctured and cauterized with silver nitrate immediately followed by saline solution.

### Wounds of the Cornea

Wounds of the cornea appear quite commonly in horses and dogs, but are rarely seen in other animals.

**Cause**—Wounds of the cornea are caused by the animals being injured or coming in contact with sharp objects. They may also be caused by burning or cauterization, but not commonly.

According to the location these wounds are classified as superficial, deep or completely perforating. Perforating wounds are usually found on the upper part of the cornea, near the sclera.

**Symptoms**—The symptoms of wounds of the cornea are photophobia, lachrymosis, pain on pressure, swelling and heat in the region of the affected eye. In perforating wounds it frequently occurs that the posterior chamber of the eye becomes infected and suppurates.

Wounds of the cornea that are not infected heal rapidly, leaving a small cicatrix. Those that are infected generally lead to ulceration. Perforating wounds sometimes lead to the formation of anterior synechia.

**Treatment**—The treatment of these wounds consists in instilling into the eye warm boric acid solutions. If there is great pain and photophobia present, use a few drops of cocaine solution. Any metallic preparation is strictly contraindicated, because the metallic base in contact with the free

surface of the wounds leads to the formation of an albuminate with a resulting leukoma.

### Ulceration of the Cornea

Ulceration of the cornea is characterized by a chronic, circumscribed, progressive, suppurative inflammation of the cornea.

**Occurrence**—Ulceration of the cornea very rarely occurs primarily, but is seen most commonly as a symptom of or during the course of some other disease, in which case it appears partly from decreased vitality and partly from infection. Ulceration of the cornea may appear as a symptom in the following diseases: Diabetes, influenza, poisoning from cotton seed meal and suppurative keratitis.

**Symptoms**—In ulceration of the cornea the remaining portions of the eye generally remain intact, although in some cases there may be found posterior synechia or suppurative panopthalmia.

There appears on the cornea a small bluish area, which is rough, somewhat resembling ground glass in appearance. This is the ulcer itself.

Non-perforating ulcerations heal by means of vascularization from the periphery of the cornea to the ulcer. As a result of the ulcer healing there is a leukoma found, which is a cicatrix.

**Course**—The course of ulceration of the cornea is chronic.

**Treatment**—The treatment of ulceration of the cornea is prophylactic in symptomatic cases, unless the ulcers become indolent, when a few drops of warm boric acid or one per cent creolin solutions may be instilled into the eye.

Chronic indurating ulcers should be cauterized with a five per cent solution of silver nitrate, applied with a camel's hair brush, followed by a saline solution.

It is usually advisable to give some general treatment, as potassium iodide, arsenic or iron preparations.

### Leukoma

A leukoma consists of any chronic incurable opacity of the cornea causing it to become opaque. It consists of a cicatrix in the matrix or on the surface of the cornea. This opacity has the appearance of ground glass and may be any color due to the absorption of pigment.

Leukomas are not defects unless they occur over the pupil or interfere with the sight of the animal by covering large areas.

A leukoma is practically an incurable condition, when once completely formed, but forming may be partially relieved by putting calomel or red oxide of mercury directly against the cornea. If a leukoma is very superficial it may be removed with a knife. From a cosmetic standpoint they may be tattooed with India ink and in this manner be made invisible.

### Iritis

Iritis is an inflammation of the iris.

**Cause**—Iritis rarely appears as a primary disease, but appears during the course of, or as a symptom of, some other disease.

**Symptoms**—The symptoms of iritis consist in the presence of a fibrinous exudate in the anterior chamber of the eye. This exudate consists of a yellowish flocculent mass, somewhat resembling butter. This may be discolored by the addition of blood. If this exudate becomes purulent it gravitates and appears on the floor of the anterior chamber of the eye as a greenish mass.

The iris itself is changed in appearance. In very acute conditions it becomes swollen and injected, and as a result



of the swelling, the pupil appears like a slit and does not respond to light.

In chronic adhesive iritis, as seen in periodical ophthalmia, the iris becomes adherent to the lens, forming posterior synechia. As the result of posterior synechia, the iris is torn, causing the outline of the pupil to become irregular. When the pupil is dilated, small particles of the iris will be found to be adhering to the lens.

In traumatic iritis the iris becomes adherent to the cornea, forming anterior synechia.

In iritis there are found such other symptoms as photophobia, lachrymosis, conjunctivitis and marked injection of the episcleral vessels.

**Course**—The course of iritis is acute, but may lead to chronic changes in the eye.

**Treatment**—The treatment consists in instilling solutions of atropine and cocaine into the eye. Moist heat applied externally and potassium iodide internally will be found very serviceable.

### Cyclitis

Cyclitis consists of an inflammation of the ciliary bodies.

**Cause**—Cyclitis is generally symptomatic and is caused by the spreading of an inflammation from the cornea and iris. It may occur primarily from a very severe injury, but only rarely.

**Symptoms**—Iritis is seen most commonly as a symptom of periodical ophthalmia; it very rarely appears as such. Cyclitis presents the following symptoms: Photophobia, pain on pressure over the eye, swelling of the iris, opacity and swelling of the crystalline lens, and injection of the conjunctiva. In severe cases that become prolonged, there is luxation of the lens, atrophy of the bulb, and the formation of posterior synechia.

**Course**—The course of cyclitis is acute or chronic.

**Treatment**—The treatment consists in dropping a few drops of atropine solution into the conjunctival sack, and the application of moist heat externally.

## DISEASES OF THE CRYSTALLINE LENS

### Cataract

By the term cataract is meant any condition which renders the crystalline lens opaque.

**Cause**—A cataract is usually due to some regressive process of metabolism, which causes a diminished blood supply to the lens, with destruction of the cells, or the infiltration of the lens with foreign substances, as fat, lime salts or cholestrin. A cataract may also be due to some pathological condition of the epithelium on the external surface of the capsule of the lens.

According to the cause the following forms of cataract must be described separately: Symptomatic, traumatic, senile, congenital, and diabetic.

**Symptomatic Cataract** is the result of an inflammatory condition of the tissues surrounding the lens, which in turn lead to disturbances of nutrition of the lens, with the formation of cataract. Symptomatic cataract also occurs during the course of, or as the result of, certain infectious and contagious diseases, as pleuro-pneumonia, influenza, dog distemper, malignant head catarrh, etc. In these cases it is undoubtedly also due to malnutrition.

Following iritis there may be a circumscribed or partial opacity of the lens as the result of adhesions, or the spreading of an inflammatory condition. Following a very severe case of cyclitis there is usually a diffuse or total opacity of the

lens. A very common form of symptomatic cataract is seen in moon blindness.

**Traumatic Cataract** is the direct result of an injury to the lens itself, or the entrance of foreign bodies or parasites in the eye. The lens may be injured by a hard blow, or running into some stationary object with great force, causing luxation or subluxation with resulting cataract formation. This form of cataract may also follow severe exertions, causing increased blood pressure. A traumatic cataract forms very rapidly, and has been known to occur from a very severe injury, in from twenty-four to forty-eight hours.

**Senile Cataract** can be diagnosed easily by the fact that the opacity in the lens begins to form in the center first and from this point the opacity becomes diffuse. This form of cataract is usually the result of a degenerative process, and is seen in old animals, especially old dogs.

**Congenital Cataract** is one which is acquired during foetal life. It appears as a circumscribed opacity of the lens at the time of birth. This form of cataract does not change, but remains the same throughout life.

**Symptoms**—The symptoms of cataract consist in an opacity of the lens and dilation of the pupil. The color of the opacity is usually whitish or yellowish, but may vary greatly. A partial cataract consists in an immovable opacity which only affects a portion of the lens.

It is very hard to determine the exact length of time a cataract has existed, but as a general rule it requires about six weeks for a cataract to form completely. The exception to this is traumatic cataract.

**Treatment**—The treatment of cataract in animals is practically worthless. If the lens is removed as in man, the eye has lost its focusing power, and the animal will only be able



to discern objects at certain given distances. From a cosmetic point of view the lens may be removed, or the cornea tattooed with India ink, to cover up the presence of the cataract. If the cataract is in the state of formation, internal treatment may check it. For this purpose preparations of iron, arsenic, iodine or mercury may be given.

## DISEASES OF THE RETINA AND OPTIC NERVE

### Amaurosis

From a veterinary standpoint, amaurosis is the only important disease of the retina and optic nerve, or both, in which there are no apparent external changes in the eye itself. This condition is commonly known as "star gaze."

**Cause**—The exact cause is unknown, but occurs secondarily or symptomatically as a general rule. It occurs secondarily to and follows contagious diseases, intoxications, ptomaine poisonings, neuritis, tuberculosis, tumors along the course of the optic nerve, diseases of the brain, etc. This disease has also been known to be congenital.

From a pathological standpoint this paralysis is either total or partial, and affects either the optic center, optic nerve or the retina.

**Symptoms**—The diagnostic symptom of amaurosis is a dilatation of the pupil which is constantly present. The pupil does not respond to light, and the reflection of light on the cornea is a characteristic sky blue. The retina is pale, atrophic and loosened, due to the paralysis. This condition of the retina can easily be seen with a mirror.

The animal holds the head to one side, stumbles and can be led into or against any object. The finger can be passed directly against the cornea, if the tactile hairs are not touched.

**Course**—The course is chronic.

**Treatment**—This condition is practically incurable, therefore treatment is worthless. Strychnine may be used, but its therapeutic action in these cases is doubtful.

## PERIODICAL OPHTHALMIA

### Moon-Eye

Periodical ophthalmia consists in a specific, non-suppurative, probably infectious panophthalmia of the horse. This disease is an inflammatory process affecting the entire eyeball and its appendages.

**Cause**—The specific cause of this disease is unknown at present, but it is probably one of the following: Protozoa, cysticercus, bacillus, micrococcus, or staphylococcus.

It is most likely a miasmatic disease. The infection seems to enter by way of the mouth, in the food and water, gains entrance into the circulation, lodging in the eye. A direct infection from animal to animal does not seem to take place. Artificial inoculation with the discharge from an infected animal will cause an attack of the disease in about forty-eight hours.

Young horses seem to have a predisposition to this disease, as it is seen to occur most frequently between the ages of three and six years. There is nothing definite known about the period of incubation.

**Occurrence**—This disease seems to be stationary in certain localities. It is generally seen to occur in animals that pasture on low, damp territory, along creek and river bottom and on marshy ground. In most instances there will be found a district where the disease is stationary. There may be an outbreak of the disease following high water, with the lodging of debris on the pasture.

**Symptoms**—The symptoms are divided into the acute attacks and the chronic changes in the eye as a result of the recurrence of the acute attacks.

The symptoms of the acute attacks appear very suddenly. The owner will state that it came on over night. There are symptoms of severe photophobia, lachrymosis, heat and pain on pressure over the eye. As a rule only one eye is affected. The conjunctiva is injected, swollen and the pupil contracted so that it appears like a slit.

After a few days there is seen the product of iritis on the floor of the anterior chamber of the eye. This is in the form of a yellow fluffy body, resembling butter, about the size of a large navy bean. By examining the retina at this time it is found to be swollen, roughened, yellowish in color and no marked line of distinction between the tapetum lucidum and nigrum.

The height of the disease is reached on the fourth or fifth day. After the resorption of the exudate begins, pain decreases, the discharge is lessened, and in from ten to fifteen days the eye apparently returns to normal.

### Chronic Changes Due to Recurrency

The chronic changes due to recurrency of the disease appear after three to five acute attacks. The iris becomes adherent to the crystalline lens, the edges of the iris are torn and the outline of the pupil is very irregular. The crystalline lens becomes striped in appearance. Finally, there is atrophy of the iris, cataract formation and floating retina. The consistency of the eyeball is soft, there is marked atrophy of the eyeball, causing it to sink into the orbit. As the result of the eyeball sinking into the orbit the upper lid forms a triangle sometimes spoken of as the third canthus. The eyesight is impaired early in the course of the disease.



**Prognosis**—The prognosis is always unfavorable, as it terminates in blindness. The attacks do not always appear with any regularity. They may be weeks or months apart, sometimes appearing closer together and at other times farther apart.

**Differential Diagnosis**—Iritis.

**Treatment**—The treatment is mainly expectative and symptomatic. Apply moist heat over the region of the eye in the form of hot water, Priesnitz packs or antiphlogistics.

Solutions of cocaine and atropine should be distilled directly into the conjunctival sack. Internally, potassium iodide, arecoline or eserine should be given to assist in resorption.

Probably the most satisfactory treatment consists in injecting five cubic centimeters of Lugol's solution into the fatty cushion, lodging the eye, immediately behind the eyeball. This may be repeated, if necessary, in five days. It may give rise to some acute symptoms, but these subside within a few hours.

## CHAPTER II

### DISEASES OF THE HEAD

#### DISEASES OF THE SKIN AND SUBCUTANEOUS TISSUES OF THE HEAD.

##### Wounds

**W**OUNDS are very common in the region of the lips, nose, cheeks, forehead, around the eyes, and ears. Wounds in the region of the head are more common in horses and dogs than in other animals. These wounds are generally contused or lacerated, but any kind of wound may occur. In dogs, punctured wounds from bites are not at all uncommon.

Decubital gangrene frequently results from lacerated or contused wounds in the region of the head.

As this part of the body is very vascular, these wounds have a tendency to heal with great rapidity, and do not have a tendency to scar formation. If the wounds are thoroughly cleansed, the hair and foreign bodies removed and sutured, healing takes place rapidly. These wounds have a tendency to heal by first intention if properly treated, especially in the region of the eye and false nostril. The proper method of suturing is the ordinary interrupted suture. In case too much strain comes on these sutures, a button or Bayer's suture may be applied.

Wounds that are already suppurating and granulating in the region of the head heal very rapidly by third intention, if cleansed and sutured.

These wounds are very much subject to infection, and as it is impossible to apply a bandage, some protecting oint-

ment or paste should be applied over the wound after suturing, so as to keep out infection, as ariol paste, ointment of zinc oxide, tannin, iodoform, lead acetate, or zinc sulphate.

## WOUND INFECTIOUS DISEASES

### Phlegmon

Phlegmon is an inflammation of the connective tissues. This is seen to occur very frequently, and is probably the most common wound infectious disease occurring around the head.

The phlegmon that appears in the region of the head is chiefly subcutaneous, but may be subfacial. The form of phlegmon will vary with the infection and may be suppurative or emphysematous.

The most common seat of phlegmon around the head is in the region of the larynx, lips, cheeks and eyelids.

Phlegmon may lead to necrosis formation, and if it does it will appear circumscribed and in the form of a penetrating ulcer in the region of the lips and cheeks.

**Treatment**—The treatment consists in free incision, antiseptic irrigation and dusting powders, or ointments applied to the wound surface.

### Malignant Oedema

Malignant oedema is a specific wound infectious disease. It may occur in any part of the body, but seems to occur most frequently in the region of the head and neck.

**Cause**—The most common cause is punctured wounds that become infected with the malignant oedema bacillus.

**Occurrence**—It occurs mostly in the horse and ox.

**Symptoms**—This disease appears very suddenly and spreads rapidly. It presents the same symptoms as septic



gas phlegmon. On palpation there is a peculiar crackling sound resembling emphysema. This disease leads to severe general symptoms.

**Prognosis**—The prognosis is very unfavorable, most of the cases terminate in death either from asphyxia or oedema of the lungs and viscera.

**Course**—The course is acute.

**Treatment**—The treatment consists in making free incisions into the part affected with disinfection. It is thought that parenchymatous injections of boric acid or potassium permanganate solution is also very serviceable in the treatment of this disease.

## DERMATITIS

### Superficial Dermatitis

Superficial dermatitis consists in an inflammation of the superficial structure of the skin.

**Cause**—The most common causes of this condition are pressure, decubitus or burning, but it may be caused by any irritation or infection.

**Forms**—Superficial dermatitis appears in three forms, viz: Erythematous, suppurative or hyperplastic. From a practical standpoint, suppurative dermatitis is the most important form. This is seen to occur most commonly in the dog, the cause being infection.

**Symptoms**—The skin becomes painful, hot and swollen. After a few days there is the formation of a greenish yellow suppurative exudate which causes the skin to become matted and form a crust.

**Course**—The course of this disease is acute if properly treated.

**Treatment**—The most important part about the treatment is removal of the cause and cleanliness. Keep the part clean by washing with some antiseptic and soap. This may be followed by the application of dusting powders or preferably ointments, as zinc ointment, bismuth subnitrate ointment, ichthyol or thiogénal ointment; other ointments, as boric acid, tannin or salycilic acid, may be used, but are not as serviceable as the foregoing.

### Suppurative Folliculitis

Suppurative folliculitis consists in a suppurative inflammation of the hair follicles and sebaceous glands. It is seen to occur mostly in the region of the mouth and nose, as well as the false nostrils.

**Cause**—The most common cause is ordinary pus cocci.

**Forms**—From a clinical point of view the following forms are diagnosed: Furunculosis of the nose in the dog, and folliculitis of the nose and lips in the horse.

Furunculosis of the nose in dogs is due to infection and commonly appears from wearing a muzzle.

**Symptoms**—The chief symptom consists in a great number of small fluctuating pustules deeply seated in the skin, accompanied by more or less thickening of the skin. As a rule there is a small circumscribed area affected, but under favorable conditions a very large area may become infected.

**Treatment**—The treatment consists in opening the pustules, curetting or cauterizing with silver nitrate. If the cause can be found remove it at once. If the disease persists and will not yield to treatment it becomes necessary to remove the affected portion of skin. After removing the skin, suture and use every possible means to have healing by first intention. Ointments have very little action in these cases.

Folliculitis of the nose and lips in horses most frequently occurs from an infection of glanders bacilli, but may be caused by ordinary pus cocci. It consists in a multiple, suppurative inflammation of the sebaceous glands. In severe or prolonged cases the disease spreads to the nasal cavity, involving the mucous glands.

**Symptoms**—The symptoms consist in the formation of pustules and superficial ulcers. These often spread and involve the lymphatics, causing lymphangitis, and in some cases the lymph glands in intermaxillary space also become involved and undergo suppuration.

**Treatment**—The treatment consists in incising the pustules, disinfecting, cauterizing the ulcers with antiseptic treatment of the suppurating lymphatics with the subcutaneous injection of bacterins.

## DISEASES OF THE MUSCLES AND NERVES OF THE HEAD

### Facial Paralysis

Facial paralysis appears in two forms in practice; they are central facial paralysis and peripheral facial paralysis. In general the cause of this condition is undoubtedly some irritation to the nerve center, nerve trunk or nerve endings.

Central facial paralysis usually appears as a bilateral affection in practice, although it may be unilateral, while peripheral facial paralysis generally appears as a unilateral affection. Peripheral facial paralysis is the form most commonly seen in practice.

**Cause**—The causes of central facial paralysis are new formations, abscesses, hemorrhages or thrombi affecting the



center, appearing in the cranial cavity. This disease often appears as a symptom of an infectious or intoxicating process as glanders and dourine.

The causes of peripheral facial paralysis are contusions or injuries to the nerve trunk from halter pressure, being cast or flouncing during colic, or lying so that the face is on some hard object for a long time. It has been known to occur from catching cold.

**Symptoms**—The symptoms of peripheral facial paralysis usually appear on one side of the face. There is a unilateral paralysis of the lips, nose and cheeks. The upper lip is noticeably drawn around to the affected side, while the lower lip is not so noticeably affected. There is more or less disturbance in eating and drinking, especially in prehension. There is an accumulation of food between the teeth and cheek on the affected side. In most cases the muscles of the ear become affected, causing the ear to lop to one side. There may be more or less ptosis present. This is not a constant symptom.

In bilateral peripheral facial paralysis, the muscles on both sides of the face become paralyzed. The face has a flat, expressionless appearance, the lips hanging, and the nostril seems to be very small, owing to the fact that the false nostril is collapsed. At every inspiration the false nostril drops or falls into the opening of the nostril, with severe dyspnœa resulting. As a rule this is a very serious condition, as it leads to asphyxia.

Central facial paralysis is characterized by paralysis of the nose, lips, cheeks, ears, and eyes. There are marked symptoms of ptosis affecting both eyes. It is impossible to open the eye on account of the paralysis of the sphincter muscle. The muscles of the ear become paralyzed, causing the ear to droop and point forward.

**Prognosis**—The prognosis of unilateral peripheral paralysis is the most favorable, as recovery takes place in from two to four weeks.

The prognosis of bilateral peripheral paralysis is not favorable, because it frequently leads to asphyxia.

The prognosis of central facial paralysis is quite unfavorable, and as a rule is an incurable condition.

**Treatment**—The treatment of peripheral facial paralysis consists in massage and irritating liniments applied over the affected parts. Internally, give preparations of iron, arsenic or iodine. The subcutaneous injections of strychnine over the affected area has been followed with good results. In cases of dyspnoea, perform tracheotomy.

The treatment of central facial paralysis is useless.

### Paralysis of the Trigeminal

Paralysis of the trigeminal nerve may be either peripheral or central. The lesion or irritation may affect the nerve endings, nerve trunk, or the center in the brain. This disease occurs mostly in dogs.

**Cause**—This disease may be due to external injuries, but as a rule this condition does not occur primarily but is seen as a symptom in rabies and brain diseases, in which case it is a central paralysis. In rabies a paralysis of the lower jaw is an invariable symptom. It may also appear in dog distemper, abscess formation, hemorrhage, or the formation of a tumefaction in the cranial cavity.

Peripheral paralysis of the trigeminal does not occur frequently, but when it does it is due to traumatisms and other external injuries.

**Symptoms**—Trigeminal facial paralysis appears clinically as a motor paralysis, and is characterized by a dropping of the lower jaw, in which the animal is unable to close the

mouth. The mouth can be closed very easily by the hand. This is a diagnostic symptom and differentiates it from luxation of the mandible. Along with the dropping of the jaw, there is difficulty in prehension and chewing, and in marked cases this is impossible later on. After this condition has existed for some time there is a marked atrophic condition of the massetic muscles.

**Prognosis**—As a whole the prognosis is unfavorable, while mild cases recover. When this disease follows distemper it is prolonged, but where it occurs as a symptom of rabies it is of very short duration.

**Treatment**—This consists in the use of iron, arsenic or strychnine preparations internally. Externally, massage, irritating liniments, etc., should be used.

### Trismus

Trismus is a condition in which there is a spasmodic contraction of the muscles of mastication. This condition never appears primarily, but as a symptom of some other disease. It is usually seen in tetanus and strychnine poisoning.

It never becomes necessary to treat this condition, as it disappears with the disease of which it is a symptom.

## DISEASES OF THE NASAL CAVITIES AND SINUSES

### Chronic Nasal Catarrh

A unilateral chronic nasal catarrh is the only form of nasal catarrh that is of any importance. This condition practically never occurs primarily, but is seen as a symptom of some other disease.

**Cause**—The conditions that chronic nasal catarrh are secondary to, are very difficult to diagnose, but may be one

or more of the following: Glanders, necrosis of the turbinated bones, new formations in the nasal cavities, chronic inflammation of the mucous membrane of the nasal cavities or of the sinuses, diseased teeth or fractures. To make a positive diagnosis, the nasal discharge should be carefully examined, and the nasal cavities and sinuses inspected and palpated. If glanders is suspected, a male kitten or guinea pig should be experimentally inoculated with the nasal discharge. If the discharge contained glanders bacilli, the inoculated animal will show marked orchitis in a few days.

**Treatment**—The treatment of chronic nasal catarrh depends upon the cause. If the cause is empyema of the sinuses or an inflammation of the mucous membrane of the sinuses, the frontal and maxillary sinuses should be trephined as follows:—

Make an opening into the frontal sinus with a trephine, half way between the orbit and median line, about one-half inch above the inner canthus of the eye. Then trephine the maxillary sinus one inch up and one inch back from the point of the zygomatic crest. With a chisel or punch connect the two sinuses and at the lowest point of the maxillary sinus break into the nasal cavity to insure perfect drainage. This should be followed by antiseptic irrigation.

If this condition is a symptom of glanders, the animal should be destroyed, and the carcass burned.

If due to foreign bodies, remove the foreign bodies as soon as possible. If due to diseased teeth, remove the teeth.

#### Necrosis of the Turbinated Bones

In horses a chronic nasal catarrh is frequently accompanied or caused by necrosis of the turbinated bones. This consists in a suppurative or necrotic inflammation. If it is primarily suppurative in character, it eventually becomes necrotic.



**Cause**—The most common cause is an irritation caused by an acute nasal catarrh, foreign bodies, etc.

**Symptoms**—The symptoms present themselves by a chronic unilateral suppurative nasal discharge. This discharge is quite copious, and after a time becomes necrotic and very foul smelling. The submaxillary lymph glands are swollen, and in some cases so swollen that they are primarily visible. The inflammatory process frequently spreads to the septum nasi, in which case there is unilateral dyspnoea present.

**Treatment**—If it is due to necrosis of the turbinated bones, the treatment consists in trephining into the nasal sinus about two inches below the inner canthus of the eye, on the ridge of the nose. This sinus is narrow and shallow. It is best to use a half inch trephine and make the opening immediately to one side of the median line. Then break down into the nasal cavity with the finger or some blunt object, remove the necrotic portions if possible, and irrigate with some astringent antiseptic.

### New Formations in the Nasal Cavity

In practice new formations in the nasal cavity are very frequently met with. The most common new formations are nasal polyps. These are soft, spongy growths, more or less movable, and attached to the nasal mucous membrane by a small neck.

**Treatment**—The treatment of these consists in removal by an ecasure, a curette or scissors. In some cases it becomes necessary to trephine over the growth, or split the nostril and remove it, although most cases, especially those that are low down, can be removed from the nostril.

There may be a hyperplasia of the mucous glands, causing the formation of numerous small cysts, which are sometimes called adenomatous polyps.

The vascular portion of the mucous membrane may become infected, causing a unilateral, mucopurulent, or hemorrhagic nasal discharge. The submaxillary lymph glands become involved and there is more or less dyspnoea present. On palpation this will be felt as a soft, smooth, easily hemorrhagic ulcerating surface.

**Treatment**—The treatment of these last-mentioned conditions is practically useless.

Sarcomas and carcinomas in the nasal cavities are generally secondary from the sinuses or mouth cavity, or they may be metastatic in origin. These tumors as a rule are firm in consistency, easily hemorrhagic with a tendency to involve the periosteum and break down and suppurate. Carcinomas have a tendency to involve the intermaxillary lymph glands.

**Treatment**—There is no satisfactory treatment for either of these conditions, on account of the tendency they have to recur, and the fact that they are generally secondary growths.

### Foreign Bodies in the Nasal Cavity

The most common foreign bodies found in the nasal cavities of the horse are food stuffs, teeth, broken bones, splinters, sponges and tampons. These do not give rise to any symptoms until they have been present for some time. Then they give rise to a suppurative nasal discharge, which is very offensive. In some cases the discharge seems to be very hemorrhagic.

In sheep and dogs, parasites are the most common foreign bodies found in the nasal cavity.

### Fracture of the Nasal Bones

Fracture of the nasal bones is a condition which is most frequently seen in the horse as the result of an injury. These fractures as a rule are simple, but may be compound.

**Symptoms**—The symptoms consist in a visible defect or deformity in the region of the injury, epistaxis, nasal discharge, dyspnoea and emphysema. If a pointed object caused the fracture, there will be an abnormal communication with the nasal cavity at this point. These cases frequently lead to stenosis of the nasal cavity, necrosis of the turbinated bones, and in rare cases to the formation of a fistula.

**Treatment**—The treatment consists in removing the splinters, pieces of bone, trephining if necessary to remove the splinters, followed by antiseptic irrigation. In severe cases of dyspnoea tracheotomy should be performed.

## DISEASES OF THE SINUSES

### Hydrops

Hydrops of the sinuses is a condition in which they become filled with a sero mucous, odorless fluid.

**Forms**—In the horse and ox there are two forms of this condition; these are true or retentious hydrops and false or pseudo hydrops.

True or retentions hydrops consists in a collection of catarrhal secretion as the result of the closing of the communication between the sinuses and nasal cavity, preventing the escape of the fluid. Pseudo or false hydrops consists in a congenital mucous cyst in the maxillary sinus.

**Symptoms**—Both of these conditions present the same symptoms clinically. There is a marked enlargement in the region affected, causing the face to appear bulged in the region of the sinuses. After this condition has existed for some time the bone becomes softened, and this permits bulging of the outer plate of bone. Palpation over the affected area reveals the softened consistency of the bone, while on percussion a tympanitic tone is heard. There is a sero mucous,

or muco purulent discharge from the nose, but this is not a constant symptom, for in some cases it may not be present. Inflammation of the submaxillary lymphatics may also fail to be a constant symptom, although it is present in most cases. In congenital hydrops there is often found degeneration of the nasal, maxillary and turbinated bones.

**Treatment**—The treatment consists in trephining the maxillary sinus one inch up and one inch back from the point of the zygomatic ridge, evacuate the sinus and irrigate with astringent antiseptics. It may be necessary to make an opening into the nasal cavity to insure perfect drainage.

### Empyema

Empyema is a condition in which the sinuses become infected with pus cocci, causing them to be filled with pus. This condition is quite common in the horse and is of great surgical importance.

**Cause**—The most common causes of empyema are a suppurative or catarrhal condition of the nasal mucous membrane with the process spreading to the sinuses, compound fractures, foreign bodies in the sinuses, diseased teeth, alveolar periostitis or ulcerating tumors in the sinuses. The most common cause, however, is diseased teeth.

**Symptoms**—The most prominent symptom is a unilateral suppurative nasal discharge, which is discolored and has a very offensive odor. This discharge seems to be more profuse when the head is lowered. The intermaxillary and submaxillary lymphatics are swollen and painful to the touch. In the region of the affected sinus there is usually an enlargement. On percussion the affected region is painful and tympanitic. It may occur that this condition will be associated with a complicated fracture, suppurative periostitis or fistula in the region of the sinuses.



**Prognosis**—The prognosis as a whole is favorable, especially if the sinus is evacuated before the bone becomes involved.

**Treatment**—The treatment consists of evacuating the affected sinus as soon as possible. This is accomplished by trephining. As a rule both the frontal and maxillary sinuses are affected, therefore it becomes necessary to open both sinuses, connecting them with a free opening, followed by antiseptic irrigation. An opening from the lowest part of the maxillary sinus into the nasal cavity should be made to insure perfect drainage. The frontal sinus should be trephined about one-half inch above the inner canthus of the eye, and one inch from the median line, while the maxillary sinus should be trephined one inch up and one inch in back from the point of the zygomatic crest.

These trephine openings should be made at least one inch in diameter and the opening should be kept open as long as possible to insure perfect drainage.

#### New Formations of the Sinuses.

New formations in the sinuses are not at all uncommon. As a rule they are not primary infections but appear secondarily. Mucous cysts, sarcomas, carcinomas and actinomycomas appear most commonly.

Carcinomas generally arise from the epithelium of the gums or mouth, while sarcomas arise from the mucous membrane of the sinus or the periosteum.

**Symptoms**—New formations in the sinuses will generally give rise to visible enlargements, although this is not constant. The submaxillary lymph glands become swollen and painful. Later on there is a nasal discharge mixed with blood, which is very offensive, somewhat resembling decomposition.

Sarcomas and carcinomas give rise to distintegration of the bone. They spread and involve, not only the sinuses but

the roof of the mouth and the nasal cavity. These tumors seem to replace the bone. This leads to a falling out of the upper molars or they may be extracted with the fingers. The fingers can be passed into the sinuses from the mouth by passing them alongside of the teeth. When this disease has progressed for some time, large, soft, spongy growths may be felt in the mouth cavity.

**Prognosis**—The prognosis in these cases is unfavorable.

**Treatment**—Treatment is of no practical value, as these cases are difficult to diagnose, until the diseased process has invaded the nostril and mouth, at which time treatment is useless. The majority of these cases lead to death.

If the condition can be diagnosed, or if it is met with while trephining for some other condition, the treatment consists in total extirpation with curettement, followed by anti-septic irrigation. It may be necessary to have a very large trephine opening to successfully remove the tumor.

### Diseases of the Teeth.

Rough, sharp and irregular table surfaces on the teeth appear very frequently and are produced by some abnormality in the lower jaw itself or in the placing of the lower jaw. This interferes with the act of mastication so that it cannot be properly executed. The most common defect is an abnormal narrowness of the lower jaw. This prevents the entire table surface from coming into wear, and this leads to the formation of sharp points on the outside of the upper teeth and the inside of the lower teeth. These sharp and rough edges cut the tongue and the inside of the cheeks, and as the result of chronic irritation, ulceration results. This hinders mastication and leads to digestive disturbances. On examining the teeth particles of food are found between the teeth and cheeks.

**Treatment**—The treatment consists in removing these sharp edges and points with a float. The table surface proper should never be floated in this condition, but the edges only. Great care must be taken that too much of the tooth is not removed, for in most cases more harm than good will be done if the teeth are not properly floated.

This treatment does not hold good in tongue lawling due to the teeth. If tongue lawling is due to the teeth, it is usually an abnormal narrowness of the lower jaw with sharp points. In these cases there does not seem to be the proper amount of room in the closed mouth for the tongue. It is good practice to round the inner edges of the lower teeth in these cases, and make them as smooth as possible. It may become necessary to remove the edges with closed cutters. Under ordinary circumstances tongue lawlers will yield to this line of treatment.

#### Shear Mouth.

Shear mouth consists in an abnormally slanting position of the table surfaces of the molars. The upper teeth are not above the lower teeth as they should be, but are to one side of them, so that the table surfaces of the teeth are nearly side by side instead of meeting end to end.

As a rule this condition is unilateral. This causes the animal to chew on the side that is not affected, avoiding the affected side of the mouth completely. As a result of this the teeth which are not brought into wear by mastication become affected with sharp points, caries dentium, alveolar periostitis and unilateral arthritis. These sharp points and caries dentium lead to stomatitis.

Bilateral shear mouth is generally brought about by an abnormal narrowness of the lower jaw, so that the movement of mastication cannot be properly performed. Only a small portion of the table surface comes into wear, while the remainder continues to grow down, forming rough sharp edges.

Partial shear mouth is a condition in which a few teeth are affected. It is brought about by the opposing teeth being of extreme hardness, causing great wearing, or the opposing teeth are improperly placed.

The disturbances that shear mouth gives rise to depend largely upon the severity of the case. In very mild cases, that is partial step mouth, there is practically no disturbance of mastication.

In more severe cases the act of mastication cannot be properly performed, causing the animal to eat slowly. Marked cases lead to severe disturbances of mastication, inanition and death.

**Treatment**—In partial or unilateral shear mouth the treatment consists in cutting off the irregular edges and making the mouth as smooth as possible. As much of the tooth should be cut away as will be necessary to prevent injuries to the cheeks and tongue. Very severe cases of unilateral shear mouth as well as bilateral shear mouth are incurable and treatment is useless. The condition has a tendency to grow worse ending in death.

### Step Mouth.

Step mouth consists of an irregular length of the individual teeth, causing great irregularity in the table surfaces of the individual teeth.

**Cause**—The most probable cause is unevenness of hardness of the individual teeth or an irregularity of the opposing set of teeth.

**Symptoms**—This condition leads to difficulty in mastication, causing the food to be improperly chewed. This in turn leads to disturbances of mastication.

**Treatment**—The treatment consists in cutting off the long teeth and making the table surfaces of the teeth as regular as possible.



## DISEASES OF THE INDIVIDUAL TEETH.

### Caries.

Caries is a continual dry disintegration of the entire tooth substance, including the enamel, dentine and cement.

As a rule caries begins on the table surface, while in some instances the sides of the tooth become affected first. This latter is seen most particularly in the dog, while the first mentioned condition is seen in the horse. This process soon leads to the formation of cavities. These cavities seem to follow the infundibuli of the teeth.

**Cause**—The exact cause of caries is undoubtedly some form of bacteria, although they have not been definitely isolated as yet. Such predisposing causes as chilling, soft teeth, mechanical injuries, bad food and rickets are important factors in bringing on the disease.

**Symptoms**—Teeth that are affected with caries are rough, contain cavities and are discolored brown. These teeth have a very offensive odor and have a tendency to split. This disease is more or less painful and as a result of this there is interference with mastication and stomatitis. After caries has existed for some time it may become associated with fistula and alveolar periostitis.

**Prognosis**—If properly treated the prognosis is favorable.

**Treatment**—The treatment consists in removing the diseased tooth as soon as detected. This should be done with extractors if possible. Trephining with repulsion should not be performed until extraction is found impossible.

### Alveolar Periostitis.

Alveolar periostitis consists in an inflammation of the root of the tooth, the alveolar periosteum or the para dental

membrane. In most instances all three of these tissues become affected. This inflammation is either suppurative, ossifying or actinomycotic in nature.

An ossifying alveolar periostitis is an aseptic inflammation and leads only to the adhesion of the tooth to the surrounding bone. This form is of great practical importance on account of the fact that it often renders extraction impossible, without removing a portion of the surrounding tissues.

Suppurative alveolar periostitis is seen most commonly in the horse and is the most important form from a surgical standpoint, while actinomycotic alveolar periostitis is seen mainly in the ox.

**Cause**—The most common cause of suppurative alveolar periostitis in the horse is caries. The infection is carried to the periosteum through the matrix of the tooth or along side of the tooth, between it and the gum. It may follow splitting of the teeth, compound fractures of the jaw, and injury to an adjoining tooth in extraction. It is held by some authorities that this disease is due to a specific infection.

This condition may be brought about in the dog by ulceration with a very fetid odor from the mouth. In some instances the saliva is streaked with pus and very offensive. There are also symptoms of stomatitis. In severe cases the affected teeth become loosened and have a tendency to fall out. The gums surrounding these teeth are badly inflamed. There is also a suppurative ill-smelling nasal discharge from the nostril on the affected side, swelling of the submaxillary lymphatics and in extreme cases necrosis of the bone in the region of the affected teeth.

**Prognosis**—The prognosis is favorable in ordinary cases if properly treated.

**Treatment**—The treatment consists in removing the affected teeth as soon as detected. It may become necessary

to trephine and repel the teeth; however, extraction is usually possible. If the sinuses are affected, give drainage into the nasal cavity and irrigate with astringent antiseptics.

### Tooth Fistula.

Tooth fistula is a condition in which there is a fistulous formation through the bone surrounding the tooth, as a result of some diseased process involving the tooth. From a clinical standpoint two forms of tooth fistula are diagnosable, the first is true tooth fistula and the second false tooth fistula.

**Cause**—True tooth fistula usually results from a suppurative process of long standing, which surrounds the tooth. This is then carried to the bone with a resulting necrosis of the bone and the discharging of pus forming a fistulous canal. This process is usually brought about by caries or suppurative alveolar periostitis. It may occur from a compound fracture involving the tooth, but this is very rare in practice.

**Symptoms**—In true tooth fistula the symptoms appear somewhat like a combination of caries and alveolar periostitis, but in either case there is accompanying this a fistula. This condition appears mostly in older horses and dogs. The most common seat for the fistulous opening is on the lower jaw in the horse, in the region of the premolars, and on the face in dogs in the region of the inner canthus of the eye.

The fistulous opening is small and appears somewhat constricted. By passing a probe, a canal can be detected leading to the root of the tooth. This canal discharges more or less of a very offensive exudate. As a rule, by exploring the mouth, a positive diagnosis can be made.

**Prognosis**—The prognosis of true tooth fistula should be made with care, while as a whole the prognosis is favorable.

**Course**—The course of this disease is long and drawn out; especially if it becomes complicated with empyema of the sinuses or necrosis of the turbinated bones.

**Treatment**—The treatment consists in removing the affected teeth, with curetting or cauterizing the fistulous canal. This should be followed by antiseptic irrigation. It is essential to provide good drainage for the canal. Ordinarily the tooth may be extracted, but in some cases it becomes necessary to trephine and repel the tooth. Subcutaneous injections of bacterins seems to aid markedly in the treatment of these cases.

#### **False Tooth Fistula.**

**Cause**—The cause of false tooth fistula is compound fractures, contusions and other mechanical injuries. It is seen to occur in the region of the premolars of the mandible as the results of kicks. This form of fistula has no connection with the teeth whatsoever.

**Symptoms**—The symptoms of false tooth fistula are quite similar to those of true tooth fistula, except that there are no teeth involved. The fistulous canal seems to be very superficial and it terminates in a blind ending.

**Prognosis**—The prognosis is favorable.

**Treatment**—The treatment consists in curetting or cauterizing the canal, providing drainage and antiseptic irrigation. Bacterins and antistreptococcic serum may be used to advantage in these cases.

#### **Extracting Teeth.**

In the extraction of teeth there are some things that are very necessary to observe to obtain the desired results. Before proceeding to extract a tooth, make a careful diagnosis and determine exactly which tooth is to be extracted. Then care-



fully locate the diseased tooth so the extraction can be applied to it without injury to the neighboring teeth. After fully determining this, choose the proper forceps for the tooth and see that the forceps are properly fitted before an attempt is made at extraction. Then the tooth should be loosened by lateral movements of the forcep. This must be carefully executed because the crown of the tooth is easily broken. After the tooth has been loosened, use a fulcrum and pry the tooth out.

In cases where the crown of the tooth is broken or decayed it is almost impossible to extract the tooth. In these cases trephining with repulsion must be resorted to.

#### Fracture of the Lower Jaw.

Fracture of the lower jaw is usually the result of mechanical injuries, such as being kicked or bitten, falling, stumbling and striking the jaw, by forcibly opening the mouth with a speculum, the use of a severe curb bit, or in the young by giving assistance during birth. A fracture of the mandible has been known to occur by the animal striking the chin with the knee.

These fractures may occur at any point and may be a square fracture, a median fracture of the body, a fracture of the ramus, a fracture of the alveolus, exposing the teeth, or a fracture of the neck near the articulation.

**Symptoms**—The symptoms of fracture of the mandible vary greatly, but there is usually anorexia or difficult mastication, and a painful swelling in the region of the fracture. This swelling may or may not crepitate.

**Prognosis**—The prognosis is always favorable in simple fractures, but unfavorable in compound fractures and fractures exposing the alveolus of the teeth.

**Treatment**—The treatment of these cases as a whole is very unsatisfactory, because it is impossible to apply splints

or a plaster bandage. Simple cases will generally recover if left alone. The treatment of compound fractures should consist in removing the splinters of bone, giving drainage followed by antiseptic irrigation.

### **Actinomycosis in the Region of the Lower Jaw.**

Actinomycosis appears in the region of the lower jaw as a specific wound infectious disease. It may also occur in the region of the upper jaw, but only rarely. This condition is seen mainly in the ox, and the premolars are the most common point of infection.

**Cause**—The specific cause is the rayed fungus actinomycosis. This becomes wedged between the teeth along with food particles and from here it enters the gums and finally the alveolar cavity of the teeth. The infection may not involve the teeth nor the bone, but may appear as a localized affection either in the skin or subcutaneously. In these cases it is usually caused from skin infection.

After the rayed fungus becomes lodged in the gums and alveolar cavities it gives rise to a constant set of lesions, later on forming granulomatous tumefactions. This is followed by disintegration of the tooth substance. Finally the infection is spread to the bone surrounding the teeth and periosteum, causing ossifying periostitis, granular or rarifying osteitis and eventually osteoporosis.

**Symptoms**—The main symptom is a cold, painless swelling or tumefaction. The skin is immovable over these tumefactions. After some time these tumefactions degenerate, in the center, break down and discharge, forming fistulous canals. These fistulous canals are very hemorrhagic and discharge a thin yellowish exudate, containing sulphur, yellow granules somewhat like coarse sand. Mastication may or may not be interfered with, depending upon the severity of the lesion. If the lesion is extensive it may lead to marked emaciation.

Examination of the mouth cavity reveals that the teeth in the affected region become loosened, and it is possible to extract them with the fingers in most instances. There is a very offensive odor from the mouth. There are small fungoid growths on the gums and the submaxillary lymph glands are involved.

**Prognosis**—The prognosis is unfavorable.

**Course**—The course is chronic.

**Treatment**—The treatment of these cases in which the bone and teeth are involved is very unsatisfactory and these cases are practically incurable. The progress of the disease may be checked but the chronic swellings remain permanently. Potassium iodine should be given daily in one-half ounce doses, until symptoms of iodism appear. Tincture of iodine may be applied over the tumefaction and injected into the fistulous tracts. The tracts may also be sloughed with escharotic paste or arsenic paste, but this is of no practical value. If the teeth are loose, extraction is indicated.

If the tumefaction is in the skin and subcutaneous tissues, the proper method of treatment is enucleation followed by antiseptic irrigation. In some cases it may be advisable to use escharotics in the fistulous canals, producing as much sloughing as possible. The best agents for this are arsenous acid or zinc chloride. These should be mixed with enough water and gum arabic to form a paste, then mix with waste or wicking, pack the canals and stitch. In about one week sloughing will be complete.

## DISEASES OF THE TONGUE.

### Acute Glossitis.

Glossitis is an inflammation of the tongue. Acute glossitis is either a superficial swelling of the mucous membrane, or the

inflammatory condition involves the deeper structures and is parenchymatous or phlegmonous in character.

**Cause**—Acute glossitis may appear as a primary disease from injuries, burns, cauterization, etc., or as a symptom of an infectious or contagious disease, as foot and mouth disease, anthrax, or malignant oedema. Phlegmonous glossitis is of the greatest clinical importance, because it frequently appears in the horse as the result of injuries, cauterization (chloral pills), sharp teeth, or rough manipulation while floating the teeth.

**Symptoms**—The tongue becomes greatly swollen, discolored blue or bluish black, and the surface of the tongue is rough and fissured. Along with this there is salivation, difficult deglutition and mastication, and more or less pharyngitis. In very severe cases especially from cauterization the mucous membrane of the tongue becomes necrotic. In the ox there may be a circumscribed necrosis of the tongue, which in some cases becomes completely perforating.

**Prognosis**—The prognosis of acute glossitis which appears primarily as a whole is good. Cases due to cauterization are more unfavorable, while in symptomatic glossitis it disappears with the disease of which it is a symptom.

**Course**—The course of this condition is acute.

**Treatment**—The treatment consists in warm antiseptic irrigation of boric acid, sodium bicarbonate, or potassium permanganate. These preparations will be found very useful in checking the inflammatory process. Keep a bucket of fresh water before the horse continually containing potassium chlorate. Any necrotic areas should be excised. If this disease leads to dyspnoea, perform tracheotomy.



## ACTINOMYCOSIS OF THE TONGUE.

## Wooden Tongue.

So-called wooden tongue or actinomycosis of the tongue appears as a wound infectious disease. It is seen to occur most commonly in the ox, but has been known to occur in the horse.

**Cause**—This condition is due to the entrance of the rayed fungus into the substance of the tongue, giving rise to an interstitial glossitis.

**Symptoms**—This process begins by the formation of small tumefactions, appearing somewhat like erosions or ulcers on the sides and top of the tongue. The infection enters the deeper structures of the tongue and then there arises numerous yellow granulating areas about the size and depth of a hazel nut. On section these are found to contain sulphur yellow granules and a caseous mass. This disease gives rise to the formation of new connective tissue, causing the tongue to become large and firm. As the result of this new formed connective tissue contracting, the tongue becomes contorted and drawn into various shapes. This also causes an atrophy of the muscles of the tongue, so that on section the musculature is almost absent. The submaxillary lymph glands are swollen, painful and frequently suppurate.

As the result of this enlarging and thickening of the tongue, there are disturbances in mastication and deglutition. In severe cases there is profuse salivation with a continual loss of flesh.

**Prognosis**—The prognosis in mild cases is favorable, while in severe cases it is unfavorable.

**Course**—The course is chronic.

**Treatment**—The treatment consists in giving potassium iodide internally in one-half ounce doses daily, until symptoms

of iodism appear. The tongue should be incised. These incisions should be made very deep into the substance of the tongue, followed by the free use of tincture of iodine. Parenchymatous injections of Lugol's solution are also very satisfactory.

#### Fracture of the Hyoid Bone.

Fracture of the hyoid bone is a condition which is not met with frequently in practice.

**Cause**—This condition is seen to occur most commonly as the result of drawing the tongue from the mouth roughly or with great force. It may occur as the result of necrosis of the hyoid bone from glanders.

**Symptoms**—The main symptoms are those of paralysis of the tongue. The tongue hangs from the mouth, and the animal is unable to use it. There is profuse salivation, difficult mastication and deglutition, swelling in the region of the pharynx, and in some cases the saliva is admixed with blood.

**Prognosis**—The prognosis is unfavorable.

**Treatment**—The treatment is worthless, because these cases usually lead to severe phlegmonous pharyngitis with asphyxia.

#### Paralysis of the Tongue.

Paralysis of the tongue appears in two forms, these are neurogenous and myogenous. A myogenous paralysis is usually due to external causes while a neurogenous paralysis is due to an injury or irritation of the hypoglossal nerve. This paralysis may be unilateral, bilateral, central or peripheral.

A central paralysis of the tongue may follow or appear as a symptom of an infectious or contagious disease, or a brain disease, or from a new formation in the cranial cavity or along the course of the nerve.

Peripheral lingual paralysis is most commonly brought about by various traumatisms or inflammatory conditions.

**Symptoms**—The symptoms of unilateral myogenous paralysis consist in the tongue being drawn to the affected side. If the tongue protrudes from the mouth it is from the side. This form of paralysis renders mastication and deglutition difficult.

In bilateral myogenous paralysis of the tongue, the tongue protrudes from the mouth and the animal has very little control over it. Mastication and deglutition are severely interfered with. If this paralysis appears in a mild form and becomes chronic, atrophy of the tongue follows.

**Prognosis**—As a whole the prognosis is good.

**Treatment**—The treatment consists in subcutaneous injections of strychnine or veratrin, or the use of *nux vomica* internally along with *rhus tox*.

## DISEASES OF THE PHARYNX.

### Pharyngitis.

From a surgical standpoint, traumatic and phlegmonous pharyngitis are to be considered, for these diseases are frequently associated with retro-pharyngeal and sub-parotid abscesses in the lymph glands.

The surgical treatment of these conditions consists in opening the abscesses and in cases of dyspnœa perform tracheotomy. In opening these abscesses make the incision through the skin only, and with the finger or a blunt instrument burrow into the abscess and evacuate its contents. This should be followed by antiseptic irrigation.

Tracheotomy should be performed as follows: The most satisfactory seat for the operation is in the upper third of the

trachea, at a point where the trachea is subcutaneous. Shave and disinfect the area, make an incision through the skin about one and one-half inches long parallel with the trachea. Then incise the **annular ligament** to about one-third of its circumference. This will allow the tube to be placed between two rings of the trachea. A small self-retaining tube should always be used, as they are safe. If tracheotomy is performed in this manner the wound will heal, leaving behind no visible scar. The practice of removing a portion of the cartilage from a ring of the trachea is faulty as it is not necessary, and leads to serious after effects, as chondritis and parachondritis. These are serious conditions and frequently render the animal valueless. The tube should be removed daily and cleansed.

### **New Formations in the Pharynx.**

Such new formations as actinomycomas, papillomas, cysts and tubercular new formations are found in the pharynx.

Actinomycotic new formations in the pharynx of the ox are of clinical importance.

According to the location these tumefactions are classified as anti and post-pharyngeal.

**Symptoms**—These tumefactions do not cause any noticeable symptoms, except when they become enlarged; then they cause difficulty in deglutition and respiration.

**Prognosis**—The prognosis as a whole is favorable.

**Treatment**—The chief treatment for actinomycotic tumors consists in giving potassium iodine internally in one-half ounce doses until symptoms of iodism appear. If possible, these tumors may be removed through the mouth, or through an incision made in Viborg's triangle.

In the horse there are frequently found cysts, which are soft in consistency, fluctuating, painless and filled with mucous. These are usually situated behind the pharynx and lead to



dyspnoea and difficulty in deglutition. These may be felt easily with the hand by using a mouth speculum.

**Treatment**—The treatment consists in opening and evacuating the cysts through the mouth. There is no after treatment necessary.

### DISEASES OF THE GUTTURAL POUCHES.

#### Catarrh of the Guttural Pouches.

From a surgical standpoint, catarrh of the guttural pouches is an important disease.

**Cause**—Catarrh of the guttural pouches is usually the result of the spreading of a catarrhal condition from the larynx or pharynx. It is a secondary disease and does not appear as a primary affection. The spreading of this catarrhal inflammation takes place through the Eustachian tubes. In some cases this condition is brought on by the entrance of a foreign body into the guttural pouch from the outside through a perforating wound. This later may cause an abscess, or an abscess in the region of the guttural pouches may evacuate its contents into the pouches causing empyema. As a rule, catarrh of the guttural pouches does not lead to any further disturbance, but in some cases may lead to hydrops or the formation of concretions.

**Symptoms**—The symptoms of catarrh of the guttural pouches consist in a unilateral nasal discharge, which is most marked when the head is held low. There is a soft, doughy swelling in the region of the parotid gland. This swelling is not painful and the submaxillary lymph glands are involved.

**Prognosis**—The prognosis is not always favorable.

**Course**—The course is chronic.

**Treatment**—The treatment is operative and consists in opening the guttural pouch, exacuating the contents, giving

thorough drainage, followed by irrigation with astringent antiseptic washes. This opening should be made in the center of Vilorg's triangle, which would be immediately behind the angle of the jaw, about three inches below the base of the ear. The incision should be made through the skin only with a knife, and then with a blunt instrument or the finger break into the pouches. It is dangerous to incise into the pouches on account of the proximity of large vessels.

### DISEASES OF THE EAR.

#### Ulceration of the Ear.

Ulceration of the concha and the tip of the ear appears mostly in dogs. At first this simply consists in a superficial ulceration, but on account of the irritation produced, the animal scratches, causing the disease to spread and become worse.

**Symptoms**—On the inner surface of the ear ulcerating surfaces can be seen. This leads to a slight discharge, which as a rule is not offensive. This discharge is usually suppurative, but may be bloody from the animal scratching the affected part.

**Prognosis**—The prognosis is good.

**Treatment**—The treatment consists in the use of drying agents in the form of dusting powder, as borax, boric acid, zinc oxide, etc. In severe cases, the ulcerating surfaces should be cauterized with silver nitrate, followed by dusting powders.

### OTITIS EXTERNA.

#### Canker.

Otitis externa, or otorrhea, is a catarrhal or suppurative inflammation of the skin in the region of the external auditory

canal. This condition is seen mostly in long-haired dogs with long ears.

**Cause**—The most common causes are filth, dirt, and it has been known to follow dog distemper.

**Symptoms**—The most prominent symptom is a slimy foul smelling discharge, which along with filth and dust forms a mat or crust just below the ear. This disease seems to be painful, for the animal holds the head to one side and continually shakes the head. By examining the ear, the skin at the base of the ear seems to be slightly necrotic and covered with the slimy exudate.

**Prognosis**—The prognosis as a whole is good.

**Course**—The course is chronic.

**Treatment**—Before any medicinal agents are applied, remove the filth and the long hair, and thoroughly cleanse the parts with soap and water. This is to be followed with antiseptic washes or dusting powders. In all probability alcoholic solutions of antiseptics will be found most serviceable from a practical standpoint, as Balsam of Peru, ten per cent; calendula, ten per cent; chinisol, ten per cent; ichthyol, ten per cent. Borax and boric acid with iodoform will be found the most satisfactory dusting powders. Any medicinal agents used must be applied with great regularity, for these cases are obstinate and need careful treatment.

### Otitis Media.

Otitis media consists in an inflammation of the mucous membrane lining the middle ear. It is seen most commonly in dogs but may occur in any animal.

**Cause**—In dogs otitis media is most frequently caused from pharyngitis or the spreading of an inflammatory condi-

tion from the outer part of the ear, and by parasites. In horses, a suppurative otitis media may occur from the entrance of foreign bodies. The most common symptom is deafness. This condition is incurable.

## DISEASES OF THE PAROTID GLAND.

### Salivary Fistula.

Salivary fistula is a condition in which there is an abnormal communication between a salivary gland or duct, with the external surface of the body. Clinically, salivary fistula appears in two forms. The first is a fistula of the gland and the second is a fistula of the duct.

**Cause**—The causes of both forms are irritations, injuries, and wounds from external sources.

**Symptoms**—The symptoms of glandular salivary fistula and fistula of the duct are similar. In a glandular fistula the opening is in the region of the affected gland, while in fistula of the duct, Steno's duct is affected most commonly, and the opening is where the duct passes around the angle of the jaw. A salivary fistula is characterized by a small round constricted opening, which discharges more or less saliva. The amount of saliva discharged varies, but is more profuse during mastication.

**Prognosis**—The prognosis depends upon the cause and the length of existence of the fistula.

**Treatment**—The most logical treatment consists in destroying the function of the affected gland. This may be accomplished by making parenchymatous injections of Lugol's solution into the gland. It may become necessary to extirpate the gland. In fistula of the duct, the opening may be cauterized and sutured with a purse string suture. However, this



does not give desired results and sooner or later it becomes necessary to destroy the function of the gland. In rare cases there may be a dilatation of the duct as the result of fistula.

### Salivary Concrements.

Salivary concrements are deposits of lime salts of various shapes and size, which are found in the ducts of salivary glands, or in the glands themselves. In horses, these frequently become so large that it leads to ectasea of the duct.

**Cause**—The supposition is that foreign bodies pass up the duct from the mouth, and on these there is precipitated lime salts.

**Symptoms**—These concrements may be felt as hard firm bodies, which are movable any place along the course of the duct or in the gland itself. As a rule, they are found in Steno's duct where it passes around the angle of the jaw. They may occur single or in multiple.

**Treatment**—The treatment consists in removing the calculus. This consists in incising the duct, removing the calculus, and carefully suturing. If the duct is not carefully and properly sutured, a fistula will result. The walls of the duct should be sutured with catgut. Continuous sutures are preferable. Then pack the wound and apply enough sutures to retain the packing. After three days, remove the pack and allow the wound to heal by second intention.

### Fistula of the Ear.

An ear fistula consists in a congenital malformation at the base of the ear. This condition generally appears in colts.

**Cause**—The most common cause is an encysted tooth becoming lodged at the base of the ear. In some cases an atheromatous cyst is the cause. Sometimes during embryonic

life there is a bit of tissue misplaced, which later on forms a tooth. As a rule, this tooth is similar to a molar.

**Symptoms**—At the base of the ear there is a small round, constricted, fistulous opening, which discharges a mucopurulent exudate. By passing a probe into this fistulous canal, the end of the probe will come in contact with a hard object. This is the misplaced or encysted tooth. As a rule, this canal is short, not being over three or four inches in length.

**Prognosis**—If properly treated the prognosis is good.

**Treatment**—The treatment consists in incising down onto the cyst and removing it along with its contents. This should be followed with antiseptic irrigation. The fistulous tract should be cauterized or curetted, followed by antiseptic irrigation.

### Fracture of the Skull.

Fractures of the different bones of the skull are common in the domestic animals. These fractures may be simple, compound, fissured, splintered, or in a young animal there may be an impression in which the position of the bone is changed, without any serious injury to the bone itself.

**Cause**—The most common cause of this condition is accidental mechanical injuries and various traumatisms.

**Symptoms**—Locally in the region of the fracture there is pain, swelling and crepitation. In a compound fracture there is a wound exposing splinters of bone. There may be simply an impression or indentation in young animals. If the fracture involves the nose or mouth, there will be epistaxis or hemorrhage from the mouth.

**Prognosis**—The prognosis of simple fractures is always favorable, while in compound fractures the prognosis should be made with care.

**Treatment**—In simple fractures, treatment is not necessary unless it is an indentation, when it becomes necessary to trephine and replace the bone, followed by antiseptic irrigation.

In compound fractures, great antiseptic precautions are necessary. Remove all splinters of bone, followed by antiseptic irrigation.

## DISEASES OF THE NECK.

### Wounds.

Wounds of the neck are very common and usually result from biting, collisions, etc. Frequently there is a wound or abscess formation from the subcutaneous injection of drugs, phlebotomy, tracheotomy and oesophagotomy. As the result of these affections there may be various wound infectious diseases, as phlegmon, abscess, fistula, and necrosis of the skin. Tetanus and malignant oedema may occur, but not commonly. Where they do occur, they are usually the result of hypodermic injections. The treatment of these wounds is the same as all other wounds, viz., drainage and antiseptic irrigation.

Contusions of the musculature of the neck are usually the result of collision and accidental injuries and consist in open wounds or a hemorrhagic infiltration with the formation of hematomas or myositis. As the result of infection there may be phlegmon, abscess formation, or the formation of a fistulous tract. The most common seat of infection is the mastoido-humeralis muscle.

**Symptoms**—The symptoms are a circumscribed painful swelling, the head is held to one side, and on motion the animal shows some lameness. There may be seen large encapsulated abscesses about the middle of the neck, under the mastoido-humeralis muscle. These are very similar to those seen on the point of the shoulder. Chronic fistula may also

occur as the result of a circumscribed necrosis of the musculature or of the fascia.

**Treatment**—The treatment consists in incision and antiseptic irrigation.

Injuries to the vessels are not as common, but may occur as a result of injury or from blood letting (phlebotomy). A severe injury to the carotid, causing it to be severed, usually ends rapidly in death as a result of hemorrhage. Injuries to the jugular usually occur as the result of phlebotomy or intravenous injection, or the jugular may be involved in the so-called shoulder abscesses and in opening these abscesses it may be severed. The jugular may become involved as a result of severe phlegmon in the region of the neck.

### Jugular Fistula.

A common result of injuries to the jugular is the so-called jugular fistula.

**Cause**—The causes of this are phlebotomy, in which the skin and instruments contained some infection, and this was carried to the walls of the vein by blunt instruments, or making several incisions in the same region in phlebotomy. Thrombo-phlebitis, as a result of intravenous injection, may also play an important part in the cause of fistula of the jugular.

**Symptoms**—The symptoms are those of a suppurative thrombo-phlebitis and periphlebitis. The symptoms usually begin with a phlegmon in the region that was incised; this opens and there is discharged a bloody exudate containing some pus. The entire vein is swollen, especially in the region of the head. Then there is multiple abscess formation along the course of the vein. The visible mucous membranes are bluish in color, and there are edematous swellings around the head. Later



on in the course of this disease there will be difficulty in mastication, with symptoms of necrosis and pyemia.

**Prognosis**—The prognosis is unfavorable.

**Treatment**—The treatment in the earlier stages consists in opening the skin wound, draining and disinfecting. In cases of suppurative thrombo-phlebitis, that portion of the vein affected must be extirpated. This is done by tying off the vein both above and below and removing the necrotic portion, and treating the wound antiseptically.

### Goiter.

The term goiter is used to designate an enlargement of the thyroid gland. It may consist in an enlargement of the gland itself or in a new formation in the gland.

**Cause**—The exact causative factor of goiter is unknown. It seems to occur mostly in dogs and colts, but may appear in any animal.

From a pathological standpoint there are the following forms of goiter: Parenchymatous, fibrous, vascular and malignant.

**Parenchymatous goiter** is the most common form seen in practice and generally makes its appearance at about the time of birth. It is sometimes spoken of as follicular goiter. It consists in a hyperplastic condition of the gland itself, resulting in a multiplication of the epithelial cells of the gland and usually terminates in colloid or cystic degeneration. In these cases the consistency of the gland is soft and somewhat doughy.

**Fibrous goiter** consists in an increase of the interfollicular connective tissue. This form of goiter is firm, somewhat resembling a fibroid tumor. It frequently occurs that this form of goiter calcifies or ossifies.

**Malignant goiter** designates the formation of some malignant tumor in the thyroid gland.

**Vascular goiter** designates the formation of an aneurism or varicose vein in the thyroid gland.

**Prognosis**—The prognosis of goiter varies, but as a rule is favorable, especially in parenchymatous goiter.

**Treatment**—The main treatment consists in the use of iodine internally in the form of potassium iodide, and externally in the form of tincture or ointment applied to the skin in the region of the goitre. Lugol's solution may be injected into the affected gland in from three to five cubic centimeter doses with fine results. This is the most suitable method for the treatment of goiter.

A few cubic centimeters of iodoform ether may also be used in the same manner with like results.

Fibrous goiter of long standing or malignant goiter must be extirpated. In extirpating this gland, great care must be taken not to extirpate the entire gland, as this leads to death. Either remove entirely the side which seems to be most affected or open both sides of the gland and curette or scrape the parenchymatous tissue from the capsule, allowing the capsule to remain intact; suture the free edges of the capsule, apply iodoform and then suture the skin. This method allows enough of the gland to remain to sustain life. In cases where one side of the affected gland is to be removed carefully, tie off the vessels both above and below the gland, extirpate, fill the wound with iodoform and stitch the skin.

### Poll Evil.

The most common form of tumefaction on the neck of the horse is poll evil.

**Cause**—The most probable cause is an injury of some character which leads to an infection of the bursa with abscess

formation. However, all cases do not lead to abscess formation, as about twenty-five per cent of these cases remain aseptic in the form of serous bursitis or hematoma. There are two forms of poll evil from a clinical point of view.

The aseptic form is the result of traumatisms of various grades without infection. It consists in a hemorrhagic infiltration of the skin, subcutaneous tissue or the musculature, which results in the formation of a hematoma, serous or sero-fibrinous bursitis. This bursitis may become chronic, in which case it leads to the formation of parabursitis and eventually forms a hygroma.

The suppurative form consists in an infection at the time of the injury, resulting in the formation of an abscess. This may lead to subcutaneous or intermuscular phlegmon, suppurative bursitis and para bursitis, followed by necrosis of the fascia and bone.

**Symptoms**—The symptoms of both forms at first are quite similar and consist in swelling, pain and heat in the region affected. In the aseptic form there are no further symptoms except that it leads to a chronic swelling. In the suppurative form the degenerative process continues, forms fistulous canals, which reach the surface and discharge pus. The opening of the fistulous canal is round, smooth and constricted. When fistulous tracts form, the swelling becomes hard, firm and less painful.

**Prognosis**—The prognosis should be made cautiously, for some of the cases do not respond to treatment readily.

**Course**—The course is chronic, although there are a few cases that seem to disappear spontaneously.

**Treatment**—The treatment of the acute aseptic form consists in the application of moist heat, massage and stimulating liniments. This form should never be operated on until it has become chronic and hygroma formation has taken

place. In chronic cases that are aseptic it is always advisable to blister well before operating, as in a great many cases blistering will cause a resorption of the exudate.

The treatment of the suppurative form is divided into operative and non-operative. The non-operative line of treatment consists in the use of escharotics to slough the fistulous tract, draining, followed by antiseptic irrigation and dusting powders. This form of treatment is a great deal slower in action, but as a rule is more successful. After cauterizing, if the wound does not granulate, swab with equal parts tincture of iodine, phenol and glycerine. The most satisfactory caustic for these cases consists in the use of escharotic paste, which consists of four ounces of zinc chloride, one ounce of water, one ounce of gum arabic, and four ounces of powdered blood root. These should be mixed in the order given, rolled out into sticks, and inserted into the fistulous tracts, the same as a probe. In five to eight days sloughing is complete and the sloughed tissue may be removed readily.

The operative form of treatment for the suppurative form consists in removal of necrotic areas with draining, followed by antiseptic irrigation. The most successful method of removing the necrotic areas is Williams' poll evil operation, which is performed as follows: Make an incision, after shaving and disinfecting, on the top of the neck in the median line, about twelve to fourteen inches long, extending from the occipital process backward. Then carefully dissect the ligamentum nucha from the surrounding structures, split it in halves lengthwise and remove one-half at a time. The distal end should be severed first, for if the proximal end is severed first it will allow the ligamentum nucha to retract and then it is not always possible to remove the necrotic areas without making a larger skin incision. After the ligamentum nucha is removed curette the bursa, pack the wound with antiseptic gauze and suture the skin. After two days remove the pack and treat as an open wound. In performing



this operation all of the inflammatory tissue must be removed to insure success; if any necrotic areas are not removed healing will be retarded. If the wound does not have drainage, incisions should be made from the lowest point of the wound through the side of the neck.

In the treatment of the suppurative form internal treatment with indigo, potassium iodide or copper sulphate are very advantageous and seem to assist healing. Along with this, subcutaneous injections of autogenous bacterins, or polyvalent bacterins and intervenous injections of polyvalent antistreptococcic serum should be given, for it has been proven beyond doubt that they materially assist in the process of healing. If possible, autogenous bacterins should be used, and if polyvalent bacterins are used several ampules should be given at one injection. It is not necessary to give intravenous injections of polyvalent antistreptococcic serum more often than once per week, and in all probability an injection every two to three weeks would give as satisfactory results.

#### Fracture of the Cervical Vertebrae.

Fracture of the cervical vertebrae is a condition that does not occur frequently in animals, but when it does occur it is seen mainly in horses and dogs.

**Cause**—The causes are mostly accidental and traumatic. Running horses may fall on the head, the animal may run into something, or hang in the halter. In dogs it may occur from being run over, bitten or kicked. This usually involves the first four cervical vertebrae; about seventy per cent of all cases involve either the third or fourth cervical vertebrae.

In making a diagnosis of this condition, a fracture of the body must be differentiated from a fracture of one or more of the processes. These fractures may be simple, compound or fissured.

**Symptoms**—The symptoms of fracture of the cervical vertebræ are mainly those of torticollis. The head and neck will be twisted and drawn in various shapes. The neck is held stiff and there is great pain on moving the head or neck in any direction. Over the fracture there is a firm, painful swelling and crepitation. There is usually some dyspnœa, and if the body of the vertebræ is fractured there are some symptoms of spinal meningitis from pressure on the chord. In some cases these fractures lead to a severing of the carotid and internal hemorrhage, which terminates fatally. It has been observed that in some cases a fracture of the cervical vertebræ does not make itself manifest in the start, but the first symptoms are seen only after a few days. The animal may be able to work weeks before the symptoms arise.

**Prognosis**—The prognosis of fractures of the cervical vertebræ is unfavorable. As a rule, if healing does take place the neck will be held stiffly. In a great many cases this condition leads to death.

Death may be due to one or more of the following: Paralysis of the medulla due to pressure on cord, paralysis of the vagus due to compression, meningitis and myelitis, septicaemia or internal hemorrhage.

**Treatment**—The treatment consists in replacing if possible and bandaging. This is very hard to accomplish on account of the tension of the parts. Probably the most satisfactory method is to tie one rope around the neck of the animal and another rope around the loins. In this way the great tension may be overcome and the fracture replaced. After replacing, a board should be placed along one side of the neck and the entire neck placed in a cast, with the head as high as possible. After casting, tie the animal's head up and do not allow any more motion than absolutely necessary.

**DISEASES OF THE LARYNX AND TRACHEA.****Roaring.**

Roaring is in all probability the most common surgical disease of the larynx. Roaring is characterized by inspiratory dyspnœa.

**Cause**—This inspiratory dyspnœa is probably caused by a unilateral paralysis of the recurrent nerve which supplies the muscles that move the arytenoid cartilages. As a result of this paralysis the arytenoid cartilage drops into the lumen of the larynx, causing the vocal cord to be stretched and at every inspiration the vocal cord on the affected side is vibrated. This vibration of the vocal cord gives rise to a peculiar sound, which is the most characteristic symptom of the disease. As a rule the left side of the larynx is affected.

Although the exact causative factor of this disease is not positively known, there are certain conditions and factors known about it. In some instances it seems to be hereditary, as it appears commonly in certain families. Thoroughbred and standard bred types seem to be affected most commonly. Some authorities seem to think that over-exertion, causing an increased blood pressure, will give rise to this set of symptoms, by pressure on the recurrent nerve, where it passes behind the aorta. Roaring frequently follows certain infectious and contagious diseases, as laryngitis, contagious coryza, influenza, strangles, etc. It has been known to occur from a tumor pressing on the recurrent nerve, or as a symptom of blood poisoning.

**Symptoms**—This disease is characterized by laryngeal inspiratory dyspnœa while the horse is in motion. This dyspnœa always becomes more aggravated and the sound produced is louder when the horse is driven at a rapid pace. The sound that is emitted may be anything from whistling

to bellowing like a bull. As the dyspnoea increases, the sound increases, and the inspiratory movements become more labored. The nostrils dilate and if the exercise is continued, the animal will fall to the ground exhausted, struggling for breath. After a few minutes of rest these symptoms will entirely disappear. In chronic cases an hypertrophic condition of the muscles of the larynx may be felt by manipulation of the larynx externally. It is not good practice to attempt to diagnose this condition with the animal quiet or in the barn, although in marked cases any sudden exertion may produce the sound. This can be accomplished by slapping the animal on the side when it is least expected.

**Prognosis**—The prognosis should be made with caution.

**Course**—As a rule the course is chronic.

**Treatment**—Internal treatment of these cases has not proven to be of practical value, therefore the treatment is operative. There are numerous operations for the relief of this condition, but the one here given is very simple to perform and has given good results.

This operation consists in the removal of the vocal cords and the mucous membrane from the lateral ventricles of the larynx. The animal should be placed in the dorsal recumbent position with the head extended. Then shave and disinfect the area over the larynx. Make an incision through the skin to the larynx, then incise the larynx, making an opening about three inches long. Then by means of retractors spread the larynx so the field of operation will be exposed. The first step is to remove the vocal cord on both sides. In doing this, care must be exercised so that the arytenoid cartilages are not incised, for if they are, this may give rise to excessive granulations, and the operation will not be a success. Then grasp the mucous membrane lining the ventricles and carefully dissect it, removing it all. This will



give rise to a fresh wound and allows the cartilages to become attached to the wall of the larynx by means of granulation and cicatricial contracture. After healing, the lumen of the larynx remains unobstructed and there is no further dyspnœa. The after treatment consists in swabbing or spraying the larynx with Lugol's solution.

If the animal shows any symptoms of dyspnœa following the operation, tracheotomy should be performed immediately.

### **New Formations in the Larynx.**

New formations in the larynx are not seen as commonly in practice as might be expected. When they do occur they are usually found on the mucous membrane and vocal cords. They are usually circumscribed tumefactions, but may be in the form of chronic thickenings from ulceration. These tumors may be actinomycomas, papillomas, lipomas, cysts, atheromas, adenomas, sarcomas or carcinomas. In the ox there is frequently a tubercular ulceration found on the mucous membrane of the larynx.

**Symptoms**—These new formations give rise to dyspnœa both inspiratory and expiratory, difficulty in deglutition, and in some instances they cause marked emaciation. A positive diagnosis can only be made by exploratory laryngotomy and feeling or seeing the tumefaction. This condition may be suspected where a chronic incurable cough exists.

**Prognosis**—The prognosis should be guarded.

**Treatment**—The treatment consists in placing the animal in the dorsal recumbent position, performing laryngotomy and removing the tumors or cauterization of the ulcers.

The after treatment consists in spraying the larynx with mild astringent antiseptics.

### Stenosis of the Trachea.

Stenosis of the trachea is a condition in which the lumen of the trachea is made smaller either from internal or external causes. The following forms of tracheal stenosis are recognized: Cicatricial, obturation, compression and congenital.

Cicatricial stenosis is the form which appears most commonly in the horse. It generally appears from tracheotomy being improperly performed, in which a tracheal ring was incised, but may be caused from an injury fracturing a ring of the trachea. Either of these causes lead to the formation of a large amount of cicatricial tissue and thickening of the cartilage. Sometimes there develops perichondritis and chondritis, which also forms an excessive amount of new tissue.

The formation of this new tissue and the thickening of the cartilage fills the lumen of the trachea to such an extent that eventually dyspnoea develops. This dyspnoëic condition frequently becomes so severe that the animal is rendered useless.

An obturation stenosis very rarely appears in horses, but may occur from wounds of the trachea from external sources, causing excessive granulation, the formation of a tumor, or the lodging of a foreign body along the course of the trachea or in the lumen of the trachea.

Congenital stenosis of the trachea appears as a congenital defect which is visible, in which the trachea is abnormally small or distorted in shape.

**Symptoms**—The symptoms of tracheal stenosis are very pronounced and consist in both inspiratory and expiratory dyspnoea. The respiratory movements are labored and on exercise are performed only with difficulty. By auscultation stenotic tones may be heard over the region affected.

**Prognosis**—The prognosis of these cases is usually unfavorable.

**Treatment**—If this condition is caused by faulty tracheotomy it is not always possible to get results from treatment. The treatment consists in incising the trachea and removing the obstruction by enucleation or curetting, followed by antiseptic irrigation and dusting powders. This condition may be eliminated by performing tracheotomy properly and using a small permanent trachea tube.

## DISEASES OF THE OESOPHAGUS.

### Choke or Stenosis.

The term choke is used to designate a condition in which there is a foreign body lodged somewhere in the course of the oesophagus.

**Cause**—Choke, or stenosis of the oesophagus, is usually caused by a foreign body becoming lodged in the oesophagus and causing more or less wounding of the mucous membrane. The most common objects becoming lodged are potatoes, turnips, apples, pears, corn-cobs, splinters, oats, bran, or particles of food which are improperly masticated. In some cases it may also be due to new formation, parasites or an inflammatory condition of the mucous membrane or musculature, following narcosis, particles of food may become lodged in the oesophagus or compression of the oesophagus by tumors or new formations may also cause stenosis.

In the ox this latter cause is not at all uncommon and is seen as the result of a tubercular inflammation of the mediastinal or bronchial lymph glands, causing an enlargement of these glands so that they press on the oesophagus, giving rise to chronic bloating. An exostosis on the first rib has also been known to produce stenosis of the oesophagus.

It very rarely happens that oesophageal stenosis follows wounds or oesophagotomy from cicatricial contraction.

**Symptoms**—The animal is unable to swallow food and water. If the animal makes an attempt at eating and drinking the food and water is returned through the nose. After two or three days there is discharged from the nose and mouth a very foul smelling liquid, which is a mixture of food and water that has decomposed, at this time or before symptoms of bloating appear. Choke, or stenosis of the oesophagus, is frequently accompanied by such complications as dyspnoea, coughing and mechanical pneumonia. If the exact location of the stenosis cannot be located by external manipulation, the passing of a probang readily discloses the presence of the stenosis.

If the stenosis is in the region of the neck, it is spoken of as a cervical choke or stenosis, and if the stenosis is in the thorax, it is spoken of as thoracic choke or stenosis.

**Prognosis**—The prognosis as a rule is favorable but should be made with care.

**Treatment**—The treatment of this condition is divided into operative and non-operative.

The non-operative form consists in the use of eserine, arecoline or pilocarpine to increase peristalsis. Then pass a probang or stomach tube, and by pressure try to push the obstruction into the stomach. If the obstruction cannot be moved allow four ounces of oil and two ounces of chloroform to pass onto the object through the tube. This will have a tendency to dilate the oesophagus and then by means of the probang the object may be pushed into the stomach.

If the object cannot be removed by this means, oesophagotomy is indicated if the stenosis is cervical. After shav-



ing and disinfecting the area over the stenosis, make an incision through the skin down onto the oesophagus, then make an incision through the oesophagus on to the foreign body. Remove the foreign body, suture the mucous membrane and then the muscular coat with continuous sutures but separately; then pack the wound with gauze and apply enough sutures to the wound to keep the gauze in position. After a few days remove the pack and allow the wound to heal by second intention. Following this operation the animal should be fed soft food; rough food should be avoided for a week or more.

In case the stenosis is not visible, or it is thought not advisable to perform oesophagotomy, the following line of treatment has been found quite satisfactory from a practical standpoint: Pass the stomach tube down to the stenosis, then make an incision through the skin down to the oesophagus and separate the oesophagus from the surrounding tissue so that it is free. The point of incision should be about the middle of the neck. Then tie the oesophagus to the tube as tight as possible with a piece of tape. Then by means of city water or a pump exert enough water pressure to dilate the oesophagus. This pressure must not be exerted for a long period of time, but only for a minute or two at a time, after which allow the water to escape. After a short time this will have a tendency to dilate the oesophagus and the stenosis will pass into the stomach. No harm can come from this method of treatment, for if the pressure is too great the oesophagus will dilate and the foreign body will pass on before the oesophagus will rupture. The after treatment consists in treating the wound as an open wound, allowing it to heal by second intention. When the bloating becomes severe a trochar should be used under the strictest antiseptic precautions.

## DILATATION OF THE OESOPHAGUS.

### Diverticulum.

Dilatation of the oesophagus is a condition in which there is rupturing or stretching of one or more coats of the oesophagus, leading to the formation of a pouch.

**Cause**—This condition is most frequently caused by stenosis, in which food and water lodge above the stenosis and form pressure as well as decomposition there is a pouch formed in the oesophagus. This may cause a local paralysis, or in some cases may be due to an atrophic condition of the musculature. This condition has also been known to occur from cicatricial contracture, the cicatrix involving the musculature of the oesophagus and the skin. When this cicatrix contracts, the oesophagus will be pulled outward and then a pouch forms.

**Symptoms**—The symptoms of diverticulum of the oesophagus in many respects are similar to stenosis, except that the animal eats slowly and on swallowing a portion of the food passes down the oesophagus and the remainder back through the nostril. There are also symptoms of colic and bloating. There is discharged from the mouth and nose a very foul smelling exudate. If the diverticulum is in the cervical portion of the oesophagus it may be seen as well as felt. It appears as a pouch and is usually soft in consistency. If this enlargement is massaged gently it will disappear and the part appears normal. If this condition becomes chronic it leads to rapid emaciation. By attempting to pass the stomach tube or probang it is usually impossible to pass the diverticulum if it is large, as there seems to be something that impedes its going further. This does not hold true of a small diverticulum. This condition is frequently associated with coughing, dyspnoea, mechanical pneumonia, rupture of

the oesophagus, with septic phlegmon, and empyema of the thoracic cavity.

**Prognosis**—The prognosis is unfavorable, for sooner or later it leads to death.

**Treatment**—Prophylactic treatment is the most valuable in these cases and consists in feeding soft and moistened feed. In chronic cases a portion of the oesophageal wall, that is the portion which is affected with the diverticulum, should be removed. This may be performed as follows: After thoroughly cleansing and shaving, make an incision through the skin to the oesophagus. Then remove an elliptical piece of the oesophagus so that when the free edges are sutured the lumen will be about normal in size. After removing a portion of the oesophagus as described, suture the mucous membrane and the muscular coat separately, pack the wound with gauze and apply enough in the skin to hold the gauze in position. This should be followed by feeding soft feed, and in cases where there is great regurgitation of food through the nostrils, and if it is feared that food and water may pass to the lungs, perform tracheotomy. This will have a tendency to allow the food and water to pass out of the trachea tube instead of passing to the lungs.

## PERFORATION OF THE OESOPHAGUS.

### Rupture.

Perforation or rupture of the oesophagus is a condition in which the walls of the oesophagus are ruptured, allowing food and water to pass into the surrounding tissues.

**Cause**—The most common causes of this condition are external injuries or foreign bodies perforating the oesophagus from the inside. A spontaneous rupture has been known to occur from fatty degeneration, but is not common.

**Symptoms**—The symptoms depend upon the portion of the oesophagus affected.

When the rupture is in the cervical portion, there will be a tumefaction on the left side of the neck. This tumefaction appears very suddenly, is quite large and varies in consistency. In some cases it presents symptoms of septic phlegmon and emphysema. This emphysematous condition frequently spreads, involving the side of the neck and shoulder. Swallowing is difficult and in some cases becomes impossible. There is also regurgitation of food through the mouth and nostrils.

When the thoracic portion of the oesophagus is affected there is regurgitation of food, salivation, foul smelling discharge from the nose and mouth, pyo thorax, pneumo thorax and severe dyspnœa, followed by septicemia and death in a few days.

**Prognosis**—The prognosis should be guarded, but is generally unfavorable.

**Treatment**—The treatment consists in incising the skin and suturing the rupture if the cervical portion of the oesophagus is involved. Great antiseptic precautions must be taken in these cases. The oesophagus should be sutured in the usual manner, pack the wound and suture the skin sufficiently to hold the pack in place. In several days remove the pack and treat the wound with astringent antiseptics.

If the rupture is in the thoracic portion of the oesophagus treatment is of no avail.

### Paralysis of the Oesophagus.

Paralysis of the oesophagus is usually due to some disturbance of the central nervous system. It has also been known to follow various poisonings, infectious diseases and sometimes following anaesthesia.



**Symptoms**—The symptoms consist in difficult swallowing with a slight regurgitation of food. The oesophagus becomes packed with food and is greatly enlarged over its entire length. This disease is frequently followed by mechanical pneumonia. There are no symptoms of choke or retching and the animals show no signs of pain.

**Prognosis**—The prognosis is favorable.

**Treatment**—The treatment consists in withdrawing food and water from the horse, giving subcutaneous injections of strychnine and nerve tonics internally.

## CHAPTER III

### DISEASES OF THE SHOULDER

#### Shoulder Lameness.

**S**HOULDER lameness is typical swinging leg lameness and is not a specific term but is used to designate swinging leg lameness, caused by some painful lesion interfering with motion in the region of the shoulder. This lameness is usually caused by some diseased condition of the musculature. In some cases, shoulder lameness may appear to be a mixed lameness. This is seen in cases where the nerve trunk is affected. True shoulder lameness makes itself manifest when the animal extends or flexes the leg; it becomes more severe when going up grade, and less severe going down grade.

**Cause**—The causative factors producing shoulder lameness vary according to the part affected. The parts of the shoulder affected producing lameness, include the joint, the bursa, the musculature, the lymphatics, the vessels, the nerve trunks, the bone and the skin.

Diseases of the skin producing lameness appear mainly in the form of phlegmon. Diseases of the joint producing lameness appear in the form of contusion, distortion or arthritis. Diseases of the musculature appear either in the form of rheumatic or traumatic myositis. The intertubercular bursa is affected most commonly in the form of bursitis intertubercularis. Diseases of the bone are mainly in the form of fractures and diseases of the vessel in the form of thrombosis.

### Acute Omarthritis.

Acute omarthritis consists in an acute inflammation of the scapulo-humeral articulation.

**Cause**—The most common causes producing acute omarthritis are external injuries, contusions, over-exertion, or the rupture of a ligament. These causative factors are not always severe enough to produce acute clinical symptoms, but may produce chronic changes in the joint. Perforating wounds to the joint produce suppurative arthritis. In foals, this latter disease has been known to occur from suppurative thrombo phlebitis.

**Symptoms**—The symptoms are marked by the appearance of high grade lameness, which makes itself manifest during motion by abduction, adduction, flexion, or extension produced manually. By pressure over the joint, the animal shows marked pain. In cases that develop immediately from an injury there is swelling, heat and pain in the region of the affected joint.

**Prognosis**—As a whole the prognosis is quite favorable in these cases. Distortions, however, do not respond to treatment readily and are very apt to produce chronic changes in the joint, leading to chronic lameness. Rupture of the capsular ligament is most unfavorable and leads to chronic deforming arthritis.

**Course**—The course is generally short, terminating in recovery or chronic deforming arthritis.

**Treatment**—The treatment consists in absolute rest, moist heat, massage or irritating liniments applied over the region affected.

### Chronic Omarthritis.

Chronic omarthritis consists in the formation of chronic deforming arthritis. This develops from a distortion of the

joint with an injury to the cartilage and capsular ligament with hemorrhage into the joint itself.

**Cause**—This disease usually develops from the acute form in which there was distortion or severe injury. It may also be caused by a mild irritation acting persistently, as continual driving or over-exertion on hard roads. The predisposing causes of this disease are very sloping shoulders and narrow chest.

**Symptoms**—The main symptoms of this disease is mixed lameness which causes a short, choppy gait. The stride is shortened and excessive extension as well as flexion causes pain. There is no painful swelling in the region of the shoulder, but there is atrophy of the shoulder as well as of the pectoral muscles. This gives the affected joint a large appearance and causes it to be more sharply defined. As the case develops an exostosis forms around the border of the joint so that by palpation this may be readily felt. After the case has been of very long standing there is pain shown in passive movements of the joint, as abduction, adduction, flexion or extension. After a long period of rest this lameness disappears and reappears with exercise. Cocaine injections do not stop the lameness.

### Chronic Changes in the Joint.

The same chronic changes take place here that appear in any deforming arthritis, chronic spavin, ringbone and gonitis. In the bone there is the appearance of a chronic inflammatory osteoporosis and osteosclerosis, which gives the cut surface of the bone a dirty red appearance. There is the formation of new bone and enlargement of the joint surface. The cartilage is soft in consistency and very vascular. It often happens that there are pieces of cartilage floating free in the joint cavity as the result of osteochondritis. The surface and



edges of the cartilage are covered with very small, wartlike exostoses; these eventually become larger and cause a complete ankylosis of the joint. The joint capsule becomes thickened and the synovial membrane is swollen and small portions become dislodged, leading to the formation of free bodies in the joint cavity.

**Prognosis**—The prognosis of this disease is usually unfavorable and should be made with care. Severe cases are always to be considered incurable, while milder cases may be relieved by treatment.

**Treatment**—The treatment consists in rest; this is the most essential part of the treatment, along with rest blisters, and firing may be resorted to. The atrophy of the muscles may be treated with massage, injections of silver nitrate, chloroform or by setoning.

#### **Traumatic Myositis of the Shoulder Muscles.**

This consists in an inflammation of the shoulder muscles as the result of external injury.

The muscles of the shoulder which are commonly involved in this disease are the mastoido humeralis and the biceps brachi.

**Cause**—The causes of myositis are contusions, bruises, partial or total laceration, coming in contact with sharp objects, kicks, over-exertion in pulling or running.

**Symptoms**—The symptoms of traumatic myositis are characterized by typical supporting leg lameness. By palpation there is usually found a circumscribed, painful, swollen and warm area in the region of the muscle affected. There may also be haemotoma or the formation of muscle hernia. These, however, are very rare, but should always be looked for.

**Prognosis**—The prognosis of traumatic myositis taken as a whole is quite favorable. It is probably the most yielding of shoulder lameness to treatment.

**Treatment**—The treatment consists in rest, moist heat, massage, mild irritating liniments and in severe cases blistering or eventually the use of the cauter.

### Rheumatic Myositis.

This is supposed to be due to the so-called catching cold. This disease is very often confounded with haemoglobinaemia, and a very guarded diagnosis should always be given. Extreme heat or a very long period of rest seems to predispose the animal to this disease.

**Symptoms**—The symptoms of rheumatic myositis are very easily recognized by a short, choppy gait and swinging leg lameness which improves on motion. This lameness will disappear and reappear without any apparent cause. This fact is very helpful in diagnosing the disease. It may also occur that the lameness will shift from one part of the body to the other. The muscles themselves are swollen, painful to the touch, and in rare cases the muscles become infiltrated.

**Prognosis**—The prognosis of this disease should be guarded and given only after a very thorough examination, as this disease does not yield to treatment very readily.

**Treatment**—The treatment consists in massage, moist heat, and mild irritating liniments, as camphor, turpentine or iodine. In more severe cases blistering or subcutaneous injections of veratrine or morphine may be used. Internally give salicylic acid, salicylate of soda, or potassium iodide. Salicylates are considered specifics for this disease. It is not best to give the animal absolute rest, but a little gentle exercise should be given daily.

### Bursitis Intertubercularis.

This consists of an inflammation of the intertubercular bursa. The diseases of this bursa are divided into two classes, suppurative and non-suppurative.

**Cause**—The aseptic or non-suppurative inflammations of this bursa, are the result of contusions or over-exertion, causing a straining of the tendon playing over the bursa, thus bruising the bursa. Suppurative inflammation of this bursa may follow infectious disease, but as a rule it is due to punctured wounds or septic phlegmon. According to the course there are two forms, acute and chronic.

**Symptoms**—Aseptic bursitis intertubercularis is the most common form appearing in practice, and consists of a serous or sero fibrinous bursitis. Acute cases present all of the symptoms of an acute serous bursitis. In chronic cases the bursa becomes enlarged, thickened, and the inner surface is covered with granulations, causing it to become attached to the tendon. In very severe cases this bursa ossifies or gives rise to exostosis on the humerus. This condition gives rise to a typical swinging leg lameness, backing the animal or pressing over this region is very painful. Locally there is swelling heat, pain, and in cases of fibrinous bursitis there is crepitation. If the acute serous bursitis becomes chronic, it leads to the formation of a soft, painless, fluctuating tumefaction.

**Prognosis**—The prognosis of these cases is usually quite favorable, although in chronic cases the lameness is of very long standing.

**Treatment**—The treatment of the aseptic form consists of rest, massage, moist heat, and irritating applications, as blistering, etc. After a few days make a deep incision into the tumefaction, remove its contents and destroy the capsule.

In cases where there has been ossification of the bursa, total extirpation of the entire mass is essential.

**Symptoms**—The suppurative form usually appears after a direct opening of the bursa, or from the spreading of a phlegmonous process, which is suppurative in character. This form is characterized by swinging leg lameness, suppurative phlegmon, heat and pain locally. There may or may not be a discharge. If it is produced by a punctured wound, then there will be discharged from the wound an oily discharge, which is an admixture of pus and synovia.

**Prognosis**—The prognosis is usually grave. After this disease has run a course of several days, as a rule the animal develops symptoms of septicaemia and death may follow if not treated.

**Treatment**—The treatment of the suppurative form consists in free incisions, antiseptic irrigation and disinfection. In cases where septicaemia develops, quinine, potassium iodide, echinacea, echafolta or silver colloids should be given, as well as nuclein, antistreptococic serum or bacterins.

### Fracture of the Scapula and Humerus.

Fracture of these bones is quite common, as it usually appears as the result of coming suddenly in contact with a stationary object. A fracture is easily noticed and can be accurately diagnosed.

**Symptoms**—The symptoms are a suddenly appearing, severe swinging leg lameness. This lameness is so severe that it causes the animal to locomote on three legs. The affected leg is left hanging and no attempt is made at moving it. Locally there is swelling, heat, pain and crepitation may be felt or heard during passive movements. By manipulating the leg it may be readily seen that the leg has abnormal



movements, and appears to be free to move in any direction. Frequently the affected leg is shortened as the result of muscular contraction.

**Prognosis**—The prognosis of these cases, so far as the life of the animal is concerned, is good. These cases usually heal readily but the animal is left worthless for service.

**Treatment**—It is usually advisable to destroy the animal unless it is very valuable, and is to be used for breeding purposes. Intreating a fracture in a horse or ox a great many complications arise which often prove fatal. The one fact that the animal must remain standing in one position for so long a time gives rise to severe atrophy, laminitis, or the os pedis may change its position, giving rise to severe chronic changes in the foot. It is usually necessary to confine a horse in a cast, splints, or a sling. This gives rise to decubitus, which is frequently followed by a fatal septicaemia. In the dog, however, about ninety-five per cent of these cases are readily curable without any complications.

### Paralysis of the Suprascapular Nerve.

The causes of paralysis of the suprascapular nerve are usually of traumatic origin, such as contusions, running into foreign objects, laceration of a muscle, or fracture of the scapula in which the nerve trunk falls between the edges of the broken bone, etc.

**Symptoms**—The symptoms of this condition are a characteristic outward movement of the shoulder during motion. The shoulder seems to push outward and this movement or position is very characteristic. The elbow is not against the body but appears similar in position to that of the ox. There is a distinct space between the thoracic wall and the shoulder muscles, and after a few days there is marked atrophy of the shoulder muscles.

**Prognosis**—The prognosis of this disease is not favorable, especially if marked atrophy develops suddenly.

**Treatment**—The treatment consists in rest, massage, electricity, blistering and subcutaneous injections of strychnine, silver nitrate or veratrine. Internally potassium iodide, mercuric iodide or strychnine should be given along with wholesome, nutritious food. The animal should have gentle exercise daily. If this is impossible regular movements of abduction and adduction should be practiced.

### Radial Paralysis.

Radial paralysis consists in a motor paralysis of the radial nerve and seems to affect the shoulder muscles mainly.

There are two forms of radial paralysis from a practical standpoint; these are neurogenous and myogenous.

**Cause**—Neurogenous paralysis is a very common form in the horse and is usually the result of a traumatism to the side of the shoulder where the radial nerve passes over the humerus. It appears very frequently after casting, being cast in the stall, or when the animal has been down and lying in one position for a great time. Injuries to the central part of the humerus seem to be the most important in bringing on this disease.

Myogenous radial paralysis usually occurs as a secondary disease in the form of parenchymatous myositis, and follows an attack of azoturia.

**Symptoms**—The symptoms of radial paralysis consist in a peculiar breaking over when weight is placed on the leg during the act of walking. It seems as though the leg cannot support the weight of the part. The leg is usually extended and the carpus flexed. The gait is quite uncertain and the animal stumbles. If the disease does not disappear rapidly, there is a marked muscular atrophy present.

**Prognosis**—The prognosis of radial paralysis is quite favorable. These cases usually yield to treatment in from ten days to one month.

**Treatment**—The treatment consists in massage, electricity, blisters, liniments, subcutaneous injections of strychnine, and internally potassium iodide, mercuric iodide and arsenic preparations. The animal should be put on a regular diet and given small quantities of good, nutritious food.

#### **Thrombosis of the Axillary and Humeral Arteries.**

This disease appears quite frequently in the horse, and as a rule it is due to a chronic deforming endarteritis or the lodging of an embolus, which is formed from endocarditis.

**Cause**—The cause of this condition is faulty circulation.

**Symptoms**—The disease is characterized by an intermittent high grade shoulder lameness, which as a rule arises from no apparent cause; that is, there is no apparent visible diseased condition around the shoulder. This lameness appears only during exercise and disappears after a period of rest. The history of such a case would be as follows: On exercising the animal a slight lameness is noticed, which becomes gradually worse as exercise is continued. As the lameness grows worse the animal becomes uncertain in gait, stumbles, drags the foot and eventually goes down. Along with this lameness there are other symptoms, as profuse sweating, rapid pulse and rapid breathing. The heart has undergone a compensatory hypertrophy, and as a result the heart beat may be heard distinctly several feet away from the animal. The pulse of the radial artery is also absent. The affected limb is cold and there is no response to the prick of a pin. After a short period of rest these symptoms disappear entirely. In grey horses there may be a similar

set of symptoms as the result of melanosis of the axillary lymph glands.

**Prognosis**—The prognosis should be guarded, but is generally unfavorable.

**Treatment**—The treatment of a thrombus is useless, as it is an incurable condition. It frequently occurs that after the disease has run a course of from six months to a year, it is practically cured by collateral circulation. This collateral circulation supplies the blood, and the function of the leg returns, and the animal may again be useful. Therefore it is not advisable to have these animals destroyed at once, but they should be given a long period of rest on good, nutritious food, along with tonics and absorbents to assist in the canalization of the thrombus.

## DISEASES OF THE ELBOW AND FOREARM.

### Shoe Boil.

This consists in a tumor formation on the point of the elbow as the result of contusions. This malady occurs very frequently in the horse.

**Cause**—The most common cause is lying on the point of the shoe. It may be due to a great variety of causes, but all of these are in the nature of a contusion. In glanders a metastatic bursitis may appear during the course of the disease, in which case it would appear symptomatically.

There are two forms of this disease, aseptic and suppurative or septic.

**Cause**—The aseptic form of shoe boil is due entirely to traumatisms without infection.

**Symptoms**—These cases appear very suddenly, usually over night. There is found a hot, painful, fluctuating, cir-



cumscribed tumefaction of the skin and subcutaneous tissue. There may also be a sero hemorrhagic bursitis of the bursa olecrani. This usually appears in the form of a haematoma or serous infiltration of the tissues in this region. It may occur that in mild cases there will be a total resorption of the fluid in a very short time. In very severe cases that become chronic, there is hygroma formation with parabursitis resulting in a chronic thickening of the walls of the bursa with tumor formation. This tumefaction resembles a fibroid tumor, is movable, and appears immediately over the olecranon process.

**Cause**—The suppurative form of shoe boil is caused by a contusion with the entrance of pus cocci into the subcutaneous tissue and the bursa olecrani. This gives rise to a subcutaneous phlegmon or suppurative bursitis, with parabursitis and eventually necrosis of the skin. This in turn causes a diffuse swelling, which is very painful and has a tendency to necrosis and severe general symptoms. This form does not appear as suddenly as the aseptic form.

**Treatment**—The treatment of the aseptic form consists in making a free incision into the tumefaction and draining. This incision, however, must not be made too early, but after four or five days, so as to allow the acute inflammatory symptoms to subside and a thrombus to become organized in the injured vessel. The wound may be dressed in the usual way or painted with Lugol's solution. Hygromas of long standing should be completely extirpated with the knife. Doubtful cases may be sloughed with escharotic paste. This, however, is not nearly as satisfactory as extirpation. After removing the tumefaction the wound may be treated as an open wound, or it may be sutured by Bayer's method and treated accordingly.

The treatment of a suppurative shoe boil consists in the removal of the entire tumefaction as soon as possible. It is

not advisable to remove this tumefaction until the acute inflammatory symptoms have subsided. The entire mass should be removed in toto. The after treatment consists in antiseptic irrigation and dusting powders.

From a prophylactic standpoint it is well to keep the animal bedded very heavily with straw, wear a roll or pad of some description, and in this way prevent profuse hemorrhage, and keep in a box stall or tie loosely.

### Inflammation of the Radio-Humeral Articulation.

The causes of this disorder are usually traumatic in origin. They may consist in contusions or perforating punctured wounds. It frequently occurs that a spread of an inflammation may take place and affect the joint. A metastatic arthritis of this joint is very rare. The usual form is an acute suppurative arthritis.

**Symptoms**—The symptoms are severe swelling around the joint, very high grade lameness, as well as the discharging of pus and synovia from the wound. By probing the wound, the joint surface will be found to be laid bare. This disease is accompanied by severe general symptoms of septicaemia. If this disease does not kill the animal quickly there will be dropsy of the legs, and severe atrophy of the shoulder muscles.

**Prognosis**—These cases do not respond to treatment readily and are practically incurable. Very mild cases that have had only a short course may be treated successfully.

**Treatment**—The treatment consists in enlarging the wound so as to allow the finger to pass in, then irrigate very thoroughly with bichloride solution one to two thousand. After a very thorough irrigation, inject into the joint cavity a solution of iodoform and ether one to ten, and pack with

iodoform gauze. At first this treatment should be repeated every two hours. As the discharge becomes lessened and the general symptoms abate, the periods of treatment may become lengthened to four or six hours. Internally give large doses of quinine, echafolta, echinacea or potassium iodide. Severe cases should be destroyed at once, as these cases are very painful and incurable. Polyvalent or autogenous bacterins, as well as antistreptococcic serum, should be used, for it has been proven beyond a reasonable doubt, that they are useful in the treatment of these cases.

### **Fracture of the Radius and Ulna.**

Fractures of these bones occur most frequently in dogs and horses.

**Cause**—The cause is usually some mechanical injury. There are, however, such predisposing causes as osteomalacia, rickets, etc.

**Symptoms**—The symptoms are high grade lameness, loss of function, sweating and fast breathing. Locally there is heat, pain on pressure, and crepitation. The leg is found to have abnormal movements when manipulated manually.

**Prognosis**—The prognosis is unfavorable in horses and favorable in dogs.

**Treatment**—The treatment consists in bandaging and casting in young horses, cows and dogs. In cows and dogs these fractures heal very readily without any treatment at all, except perfect rest, which is insured by the application of a cast. It is usually impractical to try and have a union in aged horses. The bone will unite but as a general rule the function of the leg is disturbed indefinitely. It is usually advisable to destroy adult horses with a fractured radius and ulna.

### Fracture of the Ulna.

Fractures of the ulna alone usually affect the olecranon process.

**Symptoms**—The symptoms are abnormal movement of the olecranon, swelling, pain, crepitation in that region, and high grade lameness.

**Treatment**—The treatment of this class of fracture is the application of a cast, splints, bandaging and plenty of rest in a sling, along with nourishing food.

## DISEASES OF THE CARPUS.

### Wounds.

Contusions of the carpal joint are usually the result of falling and striking the knee on the ground. These contusions are of various grades, depending upon the force of the contusion. Superficial skin wounds heal very rapidly and may be treated with a solution of lead acetate, zinc sulphate or alum. Second grade contusions assume a more serious nature and as a result there is the formation of edema or a hematoma. These hematomas appear in the form of circumscribed, fluctuating, painless areas. More serious cases may result in phlegmon, abscess formation or hygroma if the bursa is injured.

**Treatment**—The treatment of these consists in moist heat, puncture, incision, excision, drainage and antiseptic irrigation.

Contusions of the third grade lead to necrosis of the skin and subcutaneous tissue. The treatment of these consists in removal of the necrotic areas with disinfection.



Wounds of the skin are usually three-cornered and extend to the carpal fascia in depth. These wounds are very hard to treat successfully, on account of the movement of the carpal joint. They are best treated by bandages and caustics as formaldehyde, silver nitrate, etc.

Wounding and contusing of the tendons and tendon sheaths in this region leads to a serous or suppurative tendovaginitis, and in some cases necrosis of the tendons. The treatment of this is very difficult and consists in free incision, removal of necrotic and suppurative areas with irrigation of tincture of iodine and iodoform ether. These wounds should be very carefully bandaged. It is well to use bacterins along with the other treatment in these cases.

Contusions of the joint with an abrasion of the skin usually lead to suppurative arthritis with a consequent septicaemia or pyaemia. The treatment for this is the same as for an open joint.

Aseptic contusions of the bone lead to either exostosis formation or fracture. The so-called knee spavin is the result of an injury to the bone from falling. These spavins are treated most successfully by the cautery, but are generally considered incurable, because they give rise to a very painful and mechanical lameness.

By firing and blistering the acute lameness may be overcome, but there is always a mechanical lameness left over, which renders the animal practically useless for a gait faster than a walk.

#### Knee Boil.

By the term knee boil is meant any tumefaction which may form on the anterior surface of the carpus. This is seen most commonly in the horse, but is very rare.

**Cause**—This condition is usually the result of a continual irritation, bruising from falling, injuries to this part during

the act of lying down or getting up, or of some specific infection. From a pathological point of view these tumefactions may be elephantiasis of the skin, hygroma of the bursa pre-carpalis with parabursitis or an encapsulated or organized hematoma of the subcutaneous tissue or fibrous tumors.

**Symptoms**—These tumefactions nearly always appear in the form of soft, fluctuating, painless swellings. If the skin is involved they are very firm. Hygromas and hematomas are soft and fluctuating. On the external surfaces these tumefactions are covered with a tough skin, which is the result of the irritation.

**Prognosis**—The prognosis is favorable.

**Treatment**—The treatment of this form of knee boil consists in incision, excision, injections of caustics, as iodine, silver nitrate and drainage with irrigation.

A second class of knee boil is due to a chronic tendovaginitis of the tendon sheath of the extensor carpi. These are true hygromas with an excessive thickening of the skin surrounding them. These are either traumatic or tubercular in origin. These tumefactions which are due to tuberculosis may be distinguished from the traumatic form in the following manner: The traumatic tumefactions are painless, circumscribed, fluctuating swellings, while those of tubercular origin are diffuse, painful, hot swellings, which entirely encircle the carpus and in some cases affect the forearm. This last form gives rise to lameness, general debility and atrophy of the shoulder muscles.

On post mortem the tendon sheaths are found to be very much thickened, hyperaemic and the walls are covered over with fibrin or there may be numerous floating particles in the fluid. A positive diagnosis of this condition can only be made by the tuberculin test.

A third class of knee boil is due to chronic periarthrititis and arthritis of the carpus with the formation of exostosis and ankylosis. These tumefactions are easily diagnosed by their consistency.

### **Acute Arthritis of the Carpus.**

An acute suppurative arthritis of the carpus is the result of perforating wounds involving the joint, or in some instances it may occur by metastasis.

**Cause**—This is usually the result of stumbling or falling.

**Symptoms**—The symptoms of suppurative arthritis are discharging of synovia mixed with pus (making a cream-colored fluid), severe swelling of the entire region, high grade lameness and general symptoms of septicaemia.

**Prognosis**—The prognosis of this disease is not favorable, but may be rendered more favorable, depending upon the care and treatment. It is very rare that the entire joint becomes infected. If only one portion of the joint is affected the prognosis is more favorable.

**Treatment**—The treatment is the same as for an open joint.

### **Chronic Arthritis of the Carpus.**

This is usually a chronic deforming arthritis with exostosis formation and enlargement of the entire joint. This malady occurs most commonly in the horse, but has also been seen in the ox and dog. This condition is also known as "knee spavin," and constitutes one form of the same.

This condition gives rise to a chronic incurable lameness which lasts for months and years (distinguished from knee spavin due to accidental injury). The exact cause for this disease is unknown at present, but is supposed to be due to

faulty position from shoeing, rupture of the lateral ligaments of the carpus, or following fractures of the individual carpal bones.

This disease is practically incurable where there is a large exostosis formation. The lameness may be removed to a certain extent by median or ulnar neurectomy. If the exostosis interferes with the motion of the joint it is useless to treat the case on account of the mechanical lameness which it causes.

### Hygroma Formation on the Carpal Joint.

This condition consists in a chronic serous bursitis, leading to hygroma formation. This so-called knee gall, or thoropin, is a typical joint hydrops.

**Symptoms**—Hygroma of the carpal joint consist in a circumscribed, round, painless, fluctuating, cold swelling, usually appearing on the inner surface of the radius just above the carpus. This gives rise to no apparent symptoms of lameness and constitutes a blemish affecting only the beauty of the horse.

**Treatment**—The treatment consists in extirpation if possible, otherwise a free incision may be made and the capsule destroyed with iodine. Puncture and aspirations are usually very dangerous as well as disadvantageous, because it gives rise to infection.

The so-called "road puffs," or "road galls," are also hydrops of the tendon sheaths. They are oblong, fluctuating and painless swellings, which from a practical standpoint are harmless.

The treatment of these consists in elastic bandages, massage, irritating liniments and eventually free incision into the swelling, destroying its capsule with iodine followed by antiseptic irrigation.



## DISEASES OF THE METACARPUS.

## Splints.

Splints are small exostosis of various shapes that appear on the side of the metacarpus a little above the center of the bone; about seventy-five per cent appear on the inner side of the front leg. They very rarely appear on the hind leg.

**Cause**—From a practical standpoint there are two kinds of splints; these are traumatic and spontaneous in origin.

Traumatic splints are usually caused as follows: When the animal is in motion, there is usually a certain amount of friction or motion between the large and small metacarpal bones. Faulty shoeing, faulty position in standing, stumbling and uncertainty in gait causes excessive friction between the large and small metacarpal bones. This increased friction gives rise to a periostitis; this in turn becomes ossifying, laying down new bone forming the visible enlargement. Some authorities state that standing with the fore feet far apart causes a stretching of the fascia and there is an unevenness of pressure; this in turn injures the periosteum to such an extent that there is an ossifying periostitis present.

The supposition is that spontaneous splints arise in the following manner: There is an inflammation of the bone set up from some internal cause. This ostitis eventually becomes rarifying in character, irritates the periosteum and this then gives rise to an exostosis formation. In these cases the exostosis is not a local disease process in itself, but is simply a symptom of an existing ostitis.

**Symptoms**—The symptoms of splints are as follows: Along the surface of the large metacarpal bone, there are exostoses varying in shape and size. These are not attached to the skin and are painful on pressure when they arise, and

during the acute inflammatory process, but later on become painless. In the beginning these splints often cause lameness, which is very severe, and at this time they are usually softer in consistency than bone. After ossification and adhesion takes place, they cause no lameness, and are only blemishes. It may happen that a splint will appear on the back of the bone under the tendon.

These cases are incurable, because they interfere with the action of the tendon, and the animal suffers from a chronic lameness. Splints are most easily diagnosed by passing a piece of metal over them. This gives rise to considerable pain. In blind or occult splint there is a typical splint lameness but no exostosis. This can also be diagnosed by a piece of metal or cocaine. The kind of lameness shown in splint lameness is a mixed one and varies with the case, but usually grows worse on exercise.

**Prognosis**—The prognosis as a whole is favorable.

**Treatment**—The treatment of splints consists in the application of absorbents, blistering agents, and eventually the cautery. After ossification takes place there is no treatment required. The essential treatment is rest; a long period of rest will often be sufficient treatment. Tincture of iodine applied with a brush, or iodine, alcohol, ether, and flexible collodion will cause their resorption in a great many cases. If the exostosis is quite large and the animal valuable, it may be removed with a chisel and hammer.

### **Tendonitis.**

Tendonitis consists in an inflammation of the tendons which is either acute or chronic. Tendonitis of the flexors of the foreleg is one of the most common surgical diseases of the horse. Of the flexor tendons, the suspensory ligament is involved most commonly.

**Cause**—Tendonitis is usually due to over-exertion and over-stretching of the tendon, probably due to faulty shoeing. It may also be caused by bruising or contusions. Small, weak tendons and large, loose tendons seem to be somewhat predisposed to this condition.

**Symptoms**—The symptoms of tendonitis are swelling, heat, and pain in the region of the affection. The animal affected is extremely lame, the lameness becoming more severe on exercise. If there is a partial rupture of a tendon, there will be one particular, fluctuating spot, which at first will be very painful and later on becomes painless. Eventually this fluctuating spot becomes very hard and forms a so-called tendon callous. If the disease becomes chronic, there is a shortening of the tendons, forming the so-called tendinous stiltfoot. In practice it usually occurs that all of the tendons become involved, but it may happen that one tendon will be affected alone.

**Prognosis**—The prognosis of acute tendonitis is quite favorable, while in chronic tendonitis it is more or less unfavorable.

**Treatment**—The treatment of acute tendonitis consists in rest, massage, cold in form of ice or running water, in the first stages. After a few days, apply moist heat in the form of a Priesnitz pack, irritating liniments or antiphlogistine. If the case is not better or entirely healed in ten days, it is well to apply a severe blister and give a long period of rest. If the case is near at hand, good results may be had from the application of a cast. This assures perfect rest and no other treatment is needed. It often occurs that cases will yield at once to a cast that will not yield in any other way. Chronic tendonitis seems to yield only to blistering under a bandage or the cautery, along with a long period of rest.

### Stiltfoot.

This consists in a contraction of the metacarpo-phalangeal articulation with a loss of free movement. In this condition this joint assumes the position of excessive volar flexion. This gives rise to a peculiar position of the joint and is frequently accompanied by an osseous development around the bone. There are two forms of stiltfoot: Tendon stiltfoot and articular stiltfoot.

**Cause**—Tendon stiltfoot is caused by a contraction of the flexor tendons due to chronic tendonitis, while articular stiltfoot is due to an anthrogenous contracture following arthritis, periarthritis, distortion and subluxation of the fetlock joint.

**Prognosis**—The prognosis of stiltfoot depends upon the cause. Articular stiltfoot is incurable, while tendon stiltfoot yields to treatment in most instances.

**Treatment**—The treatment of tendon stiltfoot consists in tenotomy. The indication for tenotomy must be very exact or the operation will be a failure. It is advisable to cast the animal and determine which tendon or tendons are contracted. After ascertaining this information, sever the tendons one at a time, until the leg returns to its normal position. The after-treatment consists in shoeing with a plate and giving perfect rest for two months. After this time the animal may be put to work. It may be necessary in some cases to apply a cast to the leg in order to have perfect union where the animal is quite restless. Tenotomy is contra indicated in the early stages, when there is acute tendonitis present.

The seat of operation is midway between the carpus and fetlock or tarsus and fetlock. This operation must be performed under the strictest antiseptic precautions, so that healing by first intention is assured. The incision through



the skin should be large enough to admit a probe pointed bistuory. Insert the bistuory through the skin, push the artery vein and nerve behind it, then pass it down behind the perforans. Then sever the tendons by a short sawing movement of the knife. It is not necessary to suture this wound because it is so small, but apply an occlusive bandage.

### Stiltfoot in Foals.

Stiltfoot occurs in the front legs of foals from no apparent cause. It does not follow tendonitis and seems to appear spontaneously. There are two forms which may be diagnosed in practice. These are acquired and congenital.

Congenital stiltfoot is probably the most common form and is seen in the lighter breeds of horses. The foals at the time of birth have a contraction of the flexor muscles, and as a result, they can neither walk nor stand. The cause is undoubtedly muscular, and the muscles are affected as well as the tendons. Some authorities have stated that this is due to faulty position while in the uterus.

Acquired stiltfoot in foals usually occurs about the sixth month, but may appear as late as two years after birth. This is seen in colts that are poorly nourished or that have been stabled constantly or those that are suffering from rachitis, which affects the joints or the bones themselves.

**Symptoms**—The symptoms of acquired or congenital stiltfoot in foals are first stiffness in the gait, the fetlock becomes straightened, the toes stick in the ground and the animal walks on the tips of the toes. The flexor tendons become thickened, the animal has a tendency to be down continually and there is general debility and emaciation.

**Prognosis**—The prognosis of congenital and acquired stiltfoot in foals is quite favorable. Very severe cases of course are less favorable.

**Treatment**—Congenital stiltfoot is most successfully treated by a plaster or a starch cast. If this does not bring perfect results, tenotomy should be resorted to. This will bring positive results almost immediately. The treatment of acquired (rachitis or rheumatic) stiltfoot in foals, consists in general treatment of calcium, arsenic or iodine preparations, good food and proper care. Locally, massage, liniments and casts should also be used.

### Rupture of the Flexor Tendons.

Rupture of the flexor tendons usually occurs in the fore-limb of the horse.

**Cause**—The causes may be grouped as external and internal. The external causes are the most common and are due to over-exertion and contusion. A tendon rupture may also occur from necrosis of the tendon or the fascia surrounding the tendon. Tendon rupture from internal causes usually results from insufficient nutrition following neurectomy, and such diseases as osteomalacia and rachitis.

**Symptoms**—Tendon rupture is characterized by a turning up of the toe and a high grade lameness. During motion the heel strikes the ground first, then the volar surface and in most instances the toe is turned upward. By examining the hoof manually, it is found to have great freedom of movement. At the point of rupture there is a soft fluctuating swelling, which is a haematoma.

**Prognosis**—The prognosis is unfavorable in most cases.

**Treatment**—The treatment of tendon rupture is of very little value. The animal must have the affected leg put in a cast followed by a long period of rest. Sometimes there are severe after symptoms, as a chronic incurable lameness, and

it becomes necessary in these cases to resort to the cautery or blistering.

These animals become greatly emaciated and may suffer from septicaemia or decubital gangrene.

### Fracture of the Metacarpus.

The cause of fracture of the metacarpus is usually due to accidental injuries. The symptoms are high grade lameness, heat, pain, crepitation at the point of fracture, swelling and abnormal movement of the foot. Treatment is the same as in any fracture.

### Scratches.

This is an inflammation of the skin in the region of the fetlock. It appears mostly in coarse-bred and phlegmatic animals.

**Cause**—Scratches is usually caused by such external causes as filth, blistering, chemical irritation or infection. These causes may be direct or indirect. Direct causes may be excessive moisture, sand, mud, soap, salt, ground stone from macadamized roads, ammonia or salt from streets, ice, infection of pus cocci, necrosis bacilli, etc.

**Course**—According to the course, scratches may be acute or chronic. From a clinical standpoint, there are the following forms: Eczematous dermatitis, verrucose dermatitis, gangrenous dermatitis or grease heal, and erythematous dermatitis.

**Eczematous dermatitis** usually appears as an acute erythematous condition accompanied by a painful swelling.

**Symptoms**—After this condition has existed several days it reaches the so-called moist stage, in which there is found small vesicles between the hairs, which contain a clear serous exudate. These vesicles break and discharge this exudate on

the hair, forming a sort of mat. This mass of serum and hair has a tendency to become purulent. After about one week crusts form as the result of the serum becoming dried. Mild cases heal after this crust formation and there is left behind a few dry scabs. Severe cases do not heal after treatment but continue to discharge.

**Prognosis**—The prognosis is favorable.

**Treatment**—The treatment consists in rest, cleanliness, carefully bandaging the part and the application of some drying and healing agent, as Goulard's extract and lard, equal parts, zinc oxide ointment, equal parts of tincture of iodine and glycerine and carbolic acid, five per cent solution of tannin or zinc oxide in the form of dusting powder.

**Verrucose dermatitis** usually appears in the form of a chronic hyperplastic dermatitis.

**Symptoms**—This form of scratches is characterized by a very foul smelling, suppurative secretion, which leads to ulceration and multiple granuloma formation. After this disease has run a long course, the skin becomes thickened, resulting in sclerosis of the skin and subcutaneous tissues, the hair becomes short and stubby, and in rare cases this will spread, giving rise to gangrene of the frog.

**Prognosis**—The prognosis is rather unfavorable and should be made with care.

**Treatment**—The treatment of this condition is very tedious. Before treating, the leg should be thoroughly cleansed with some antiseptic soap and water, as green soap and creolin one to ten. After this it is best to apply alcoholic agents, as a one per cent solution of creosote, bichloride one to one thousand, or carbolic acid one per cent in alcohol. These should be applied with a brush. Such other remedies may be used as picric acid ten per cent, formalin two per cent



or chromic acid ten per cent; this should be applied under a bandage. Severe cases that will not yield to treatment should be curetted or a portion of the affected skin removed with the knife.

**Gangrenous dermatitis** usually appears as a stationary disease in certain localities. It has also been known to appear in epidemic form.

**Cause**—Such causes as cold, moisture, filth, snow, etc., seem to predispose to this disease.

**Symptoms**—This disease makes itself manifest by a very painful swelling, lameness, and such general symptoms as fever and dullness. In the center of this swelling there are well marked gangrenous areas, which are discolored. After several days these small gangrenous areas of skin slough off, leaving an ulcerating surface behind. This condition usually heals by granulation and cicatrization in from two to three weeks. If this disease becomes quite severe it may lead to the formation of a quittor by the necrosis spreading to the lateral cartilage of the foot.

**Prognosis**—If the disease remains uncomplicated the prognosis is quite favorable.

**Treatment**—The treatment consists in disinfection by means of frequent irrigation, of antiseptic solutions or warm moist antiseptic bandages. Necrotic areas should be removed with a knife and ulcerating surfaces should be cauterized or painted with equal parts of tincture of iodine and aloes.

### **Foot Rot in Sheep and Cattle.**

This consists in a chronic exanthema of the skin below the carpus and tarsus, and occurring mainly in the region of the coronary band.

**Cause**—The exact cause of this condition is unknown, but it is supposed to be due to a specific infection.

**Symptoms**—This disease appears as a painful erythema of the skin, then vesicles form, and later on pustules. These pustules discharge, leaving behind ulcerating surfaces which suppurate for months. This ulcerating surface frequently becomes very large and is accompanied by septic phlegmon, septicaemia and death.

**Prognosis**—The prognosis is favorable.

**Treatment**—The treatment consists in cleanliness, new location, good wholesome food, creolin ointment, creolin and alcohol, or any antiseptic.

#### Fracture of the First Phalanx.

The cause of fracture of the os suffraginis or first phalanx is usually due to some injury. The fracture may be complete, incomplete, simple, compound or fissured. Fissures as a rule are longitudinal, and appear more often near the upper portion of the bone.

**Symptoms**—The symptoms consist in the sudden appearance of a very high grade lameness, causing the animal to walk on three legs. At the point of fracture there is crepitation, swelling, heat, pain, and the leg shows abnormal movements on manipulation. The symptoms of a fissure are more obscure and harder to recognize. In a fissure there is also the appearance of a very suddenly appearing high grade lameness, but there is no abnormal movement present. By careful palpation a pain line may be located which shows the presence of a fissure. In a fissure the symptoms of a very high grade lameness may last for months.

**Prognosis**—The prognosis of a fracture of the os suffraginis is as follows: Compound, comminuted and splintered

fractures are usually considered to be incurable. If the animal does recover it is usually left in a helpless or worthless condition. Fissures and simple fractures usually heal after about three months, leaving the animal practically as good for service as ever, but may lead to exostosis, or this bone may unite with the second phalanx.

**Treatment**—The treatment consists in applying a cast, bandages, rest and slings. If there should be lameness remaining as the result of exostosis, neurectomy should be resorted to.

#### **Periostitis on the Dorsal Surface of the Os Suffraginis.**

In some horses a periostitis with exostosis formation on the dorsal surface of the os suffraginis is seen quite frequently. This exostosis most commonly appears on the upper third or the middle of the bone.

**Cause**—The causative factors of this trouble are distortion, mis-stepping, running into foreign objects, etc.

**Symptoms**—The symptoms are a severe lameness which arises very suddenly. When the animal is standing the leg is held in the position of volar flexion. This lameness becomes more severe on hard roads and less severe on soft roads. By manipulating the leg it usually appears that this causes some pain. On the bone there will be noticed an exostosis, which may show acute inflammatory symptoms, as heat and pain. This exostosis in the earlier stages is about the consistency of cartilage, later becoming hard and painless. This condition is commonly known as high ring-bone.

This condition is often confused with fissure. In fissure the lameness would not exist more than four months and the thickening would be diffuse, that is, all around the bone. In fissure there may be a chronic lameness left behind. The

lameness of periostitis will not last longer than six weeks if properly treated.

**Treatment**—The treatment of this condition in the acute stages consists of Priesnitz packs, rest and irritating liniments. After the acute stages pass off, blistering and firing should be resorted to. As this condition occurs in young animals mainly, calcium phosphate, or potassium iodide, should be given internally.

### Osteomyelitis of the Os Suffraginis.

A primary infectious osteomyelitis of this bone is the result of the entrance of the pus cocci or other pathogenic micro-organisms into the marrow of the bone from the blood stream. The supposition is that the pathogenic organisms enter the blood stream through a phlegmon, gangrene or an inflammation of the skin. Distortions or mechanical injuries seem to be predisposing factors toward the cause of the entrance of the micro-organisms. In compound fracture there is a suppurative osteomyelitis as the result of direct infection.

**Symptoms**—The symptoms of this condition consist in a suddenly appearing high grade lameness, followed by diffuse swelling around the bone, which is firm and almost painless. Later on there is the formation of bone and this swelling becomes more hard and osseous. After several months there will form circumscribed, fluctuating areas, abscess formation and fistula.

**Prognosis**—The prognosis of this condition is unfavorable, as the animal usually dies from septicaemia.

**Treatment**—The treatment consists in treating the symptoms as they arise.



### Diseases of the Coronary Band.

Punctured wounds of the coronary band may be looked upon seriously, especially calk wounds, as they are very frequently followed by tetanus, suppurative arthritis or phlegmon. Deep wounds of the coronary band are followed by sub-coronary phlegmon, quittor, necrosis of the sensitive laminae, keloids and suppurative inflammation of the coronary band. The horn itself as the result of any of these conditions will split, crack or separate from the sensitive laminae forming the so-called hollow wall.

**Treatment**—The treatment of these wounds should be carried out under the most careful precautions. Injections of iodoform ether or tincture of iodine should be used very freely.

### Sub-Coronary Phlegmon.

Sub-coronary phlegmon consists in a suppurative inflammation of the subcutaneous connective tissue under the coronary band. If a sub-coronary phlegmon appears in the region of the lateral cartilage it is known as parachondral phlegmon.

**Cause**—The causes of sub-coronary phlegmon are punctured wounds, suppurative or necrotic inflammation of the laminae, suppurative podotrochlititis or arthritis. This disease very rarely appears primarily, but usually follows or is due to some other disease.

**Symptoms**—The symptoms of sub-coronary phlegmon consist mainly in a circumscribed (rarely diffuse) inflammatory swelling in the region of the coronary band. This swelling is hot, painful, fluctuating in given areas, and gives rise to a very severe lameness. Acute cases heal at this point without suppuration, while chronic cases lead to abscess formation in one or more places, and as a result of this abscess

formation fistulae are formed which involve the cartilage, tendon or bone. In some cases there is an absorption of this septic material causing the animal to die from septicaemia. After complete healing, there is usually a chronic thickening present, which leads to deformity of the hoof.

**Differential Diagnosis**—The differential diagnosis is acute serous arthritis. The swelling in arthritis is evenly distributed around the entire region, while sub-coronary phlegmon appears circumscribed. It is a very dangerous proceeding to incise an acute arthritis.

**Prognosis**—The prognosis of sub-coronary phlegmon is as follows: Acute cases usually recover without any further trouble. The prognosis of chronic cases is less favorable, as it leads to complications.

**Treatment**—The treatment of the acute cases consists in hot packs containing some antiseptic solution or some mild astringent lotion. Abscesses should be incised and treated accordingly; ulceration and fistula formation should be treated with caustics or by operative means.

### Distortion of the Coffin Joint.

This disease is very rare, but occurs among horses as the result of faulty position from shoeing or mis-stepping.

**Symptoms**—The symptoms are very suddenly appearing high grade lameness, swelling around the coronet, great pain shown on passive motion, especially by rotating the foot. This may be looked upon as a diagnostic symptom.

**Course**—The course of this condition varies greatly. Most cases recover in a short period of time.

**Prognosis**—The prognosis of these cases is quite variable and should be made with great care, on account of the many

complications which may arise from it, as ring-bone, arthritis or an incurable lameness may be left behind.

**Treatment**—The treatment consists in rest, moist heat and massage in the earliest stages; in the later stages plaster casts, firing, blistering and neurectomy may be resorted to.

### Ring-Bone.

This condition consists in a chronic aseptic inflammatory process accompanied by osseus formation in the region of the first phalanx. From a clinical standpoint, there are two forms of ring-bone; these are articular and peri-articular. If the joint surfaces become involved in the form of a chronic deforming arthritis, it is known as an articular ring bone. If this process is merely an exostosis, not involving the joint capsule, in the form of a periostitis ossificans, it is known as peri-articular ring-bone. This last form usually appears in the region of the attachment of the suspensory ligament.

**Cause**—The causative factors of ring-bone may be from external or internal sources. The internal or pre-disposing factors consist in an abnormal position of the leg causing an unevenness of pressure from side to side, small weak joints and bones, or faulty shoeing in which the foot is not level. The external or immediate causes are over-exertion in young horses, distortion, osteitis, fissures, fractures, and traumatisms.

**Symptoms**—The symptoms of ring-bone are lameness, which is either constant or becomes worse on exercise, and seems to become more severe on hard roads. The front legs are generally affected with this condition. The lameness seems to be mixed, but in very chronic cases is supporting leg lameness. When the animal is at rest the affected foot is usually held extended. As a result of this disease, the shoulder or croup muscles become very atrophic. By rotating

the joint, great pain is shown. The most important symptom is a large, hard, painless exostosis in the region of the coronary band. In articular ring-bone this exostosis is quite large and extends entirely around the joint, while in peri-articular ring-bone this exostosis is somewhat larger on the sides of the bone, or may appear only on one side. As a very general rule the articular form leads to ankylosis with a resulting mechanical lameness. A so-called "blind ring-bone" may appear as the result of a chronic deforming arthritis without exostosis.

From an anatomical standpoint this exostosis may be dorsal, volar, lateral, partial, plantar, or circular. In the beginning of this disease this exostosis appears as a fibrous vascular swelling about the consistency of cartilage. Later on these become osseous and very hard. On inspection these exostoses appear as rough protuberances, resembling pumice stone. On cross section, the periostium is found to be thickened, the sub-chondral bony structure is found to contain dark red cavities, filled with soft, gelatinous material. The structure of this bone resembles rarifying osteitis. Later on in the disease the gelatinous material is found to be hard and of the consistency of bone. In articular ring-bone, the joint surface is dull, rough, covered with small exostosis and very uneven. The rarifying osteitis usually begins on the edge of the cartilage and from there extends to the center. The capsular ligament and the tendons in this region are thickened and in some cases partially ossified.

**Prognosis**—The prognosis of articular ring-bone, especially if in the form of a chronic deforming arthritis, is always looked upon as grave and the prognosis is unfavorable. Even in cases of complete ankylosis there is so much mechanical lameness as to render the animal worthless.

The prognosis of peri-articular ring-bone is quite favorable in all cases. These cases usually yield to treatment



without any further inconvenience. In a great many of these cases, simply a balancing and level shoeing is all that is required to have complete healing.

**Treatment**—The treatment of articular ring-bone consists in blistering, followed by a long period of rest, firing, and eventually neurectomy. The results in all cases are quite variable.

The treatment of peri-articular ring-bone consists in rest, blistering agents and eventually firing. Neurectomy need not be resorted to only in most severe cases. In this form of ring-bone there may be a very large exostosis, but these very rarely give rise to any lameness whatever.

#### Fracture of the Second Phalanx.

As in all other fractures the cause of this is usually due to some mechanical injury. These fractures as a very general rule are multiple, that is, the bone is in a number of pieces.

**Symptoms**—The symptoms of this condition are a very suddenly appearing high grade lameness; around the coronary band there is a large, painful swelling; on passive movement there is great pain and crepitation may be felt. There seems to be great freedom of movement of the hoof, and this may be looked upon as the diagnostic symptom.

**Prognosis**—The prognosis of this condition may be looked upon as unfavorable on account of the complications which follow it. Even if the bone should heal, there would be left behind a chronic incurable lameness, which could only be relieved by neurectomy. This condition usually leads to ankylosis, the formation of a ring-bone, exostosis formation with contraction of the tendons forming a so-called stiltfoot.

**Treatment**—The treatment consists in casts, slinging, rest and eventually neurectomy.

### **Podoarthritis.**

Podoarthritis appears in three forms in practice. These are suppurative, acute aseptic and chronic deforming arthritis.

**Suppurative podoarthritis** appears most commonly as the result of a direct infection from nail puncture or tread on the coronary band involving the joint. It may also occur as the result of the spread of a suppurative inflammatory process as phlegmon, quittor or fracture of the os pedis.

**Symptoms**—The symptoms of this condition are the exudation of pus and synovia from the wound. On passing the probe, the cavity can often be explored. There is a circumscribed, painful swelling around the coronary band, the animal shows severe lameness and severe pain on passive movement. There are such general symptoms as elevation of temperature, chills and dullness and symptoms of septicaemia and pyaemia.

**Prognosis**—The prognosis of this disease is unfavorable; as a general rule death is the result.

**Treatment**—The treatment consists in antiseptic baths, soaking the foot for hours in warm antiseptic solutions. Make free incisions for drainage and inject iodoform ether into the wound along with the subcutaneous injection of autogenous or polyvalent bacterins. In cases of recovery ankylosis usually takes place in from four to six weeks.

**Acute aseptic podoarthritis** is either serous or serofibrinous in character. It is generally the result of distortion, tread on the coronet without puncture of the coronary band, over-exertion, following the operative treatment of quittor, etc.

**Symptoms**—The symptoms consist in a suddenly appearing high grade lameness, with severe, painful swelling of the

coronary band. There is considerable pain evinced by passive movements. This disease usually heals very promptly without any after effects, but may lead to chronic deforming arthritis.

**Treatment**—The treatment in the first stages consists in moist heat, rest, massage and liniments. In cases of chronic lameness neurectomy should be resorted to.

**Chronic deforming arthritis** of this joint is usually due to distortion, tread on the coronet, faulty shoeing, over-exertion, etc.

**Symptoms**—The symptoms of this condition are practically the same as those of ring-bone, without a severe exostosis formation. There are two forms, articular and peri-articular. This condition gives rise to a chronic lameness, which will usually disappear after a diagnostic cocaine injection. After this disease has been standing for some little time, there is a severe atrophy of the entire foot.

**Prognosis**—The prognosis of this condition is usually quite unfavorable and the course is chronic.

**Treatment**—The treatment consists in neurectomy.

### **Podotrochlitis.**

This is an inflammation of the bursa podotrochlearis primarily, which later on involves the navicular joint. The chronic aseptic form of this disease is commonly known as "navicular disease." In practice two forms are diagnosable; they are the acute suppurative, traumatic podotrochlitis, which is seen as the result of nail puncture, and chronic aseptic podotrochlitis.

**Cause**—Acute suppurative podotrochlitis usually follows nail puncture, which enters the navicular bursa.

**Symptoms**—This is characterized by a high grade lameness, phlegmon of the fatty frog and the heels and great pain on excessive dorsal flexion. This form usually leads to a necrosis of the tendons with abscess formation in the region of the heel.

**Prognosis**—The prognosis is generally favorable.

**Treatment**—The treatment consists in resection of the perforans tendon and bursa, with antiseptic treatment following.

The most satisfactory method of resecting the perforans tendon is as follows: After anaesthetising the animal and thoroughly cleansing the field of operation, remove the horny frog in toto, followed by removal of the fatty frog over the bursa and perforans tendon. After the tendon is exposed remove that portion that is necrotic and detach from its attachment, thoroughly cleanse and remove any other necrotic areas, fill the wound with iodoform, pack and apply an occlusive bandage. This bandage should be left in position for at least ten days. Healing usually takes place without any further complications.

Chronic aseptic podotrochlitis or navicular disease consists in a chronic deforming inflammatory condition in the region of the navicular bone. This condition usually exists in the front feet and in certain breeds.

**Cause**—Short, stumpy feet that are dry and hard seem predisposed to this disease. This condition may appear in one or both front feet. The cause is supposed to be continual over-exertion, faulty shoeing and faulty position. In the beginning of this disease the lesion is located in the bursa; from here it spreads to the navicular bone, and later on the tendon. Early in the course of the disease the tendon is slightly lacerated; later on it undergoes a partial ossification and becomes adherent to the navicular bone. The tendon



has been known to rupture in severe cases. The cartilage undergoes ulceration while the bone undergoes osteitis, followed by osteoporosis and exostosis formation.

**Symptoms**—The symptoms of navicular disease do not appear suddenly, but come on gradually during a period of several months. At first the animal is noticed to be limping, which is very slight but gradually becomes quite severe. In breaking over, the animal is noticed to show great pain, and this act is performed very rapidly owing to this fact, causing the animal to have a short, choppy gait. This lameness becomes much more severe on hard roads and less severe on soft roads and plowed ground. The lameness becomes more severe after being driven a long period of time; also becomes more severe when shod with a bar shoe or a high toe calk. The lameness seems to be irregular; at times it is worse and at other times will almost disappear on exercise. By manually forcing the bulbs together the animal will show great pain; if the toe is placed higher than the heels the animal will show great pain also. After this disease has run a course of months the foot and shoulder muscles become very atrophic. This disease is most easily diagnosed by a cocaine injection, when all other symptoms are negative.

**Prognosis**—The prognosis is quite unfavorable; most cases are incurable.

**Treatment**—The only treatment for this condition is neurectomy of the plantar or median nerves. Before performing neurectomy the feet should be softened and treated so that they are in a perfectly healthy condition.

#### **Suppurative Inflammation and Necrosis of the Third Phalanx and the Navicular Bone.**

A suppurative periostitis and ostitis of these bones is not so uncommon in practice as the result of neurectomy, frac-

ture, nail puncture and tread on the coronary band (calking). It may also occur as the result of a suppurative pododermatitis and podotrochлитis spreading and infecting to these parts. A phlegmonous inflammation of the foot may also give rise to this condition.

**Prognosis**—The prognosis is unfavorable.

**Treatment**—The treatment consists in free incisions, curetting, and antiseptic irrigation and soaking the foot for a long period of time in a warm antiseptic solution.

## CHAPTER IV

### DISEASES OF THE THORAX AND ABDOMEN

#### Wounds.

**W**OUNDING of the breast is quite common in horses and is usually the result of accidental injuries such as being kicked, run over, or rolling on sharp objects. These wounds may be superficial, deep or penetrating. Bruising or contusions in this region very often lead to phlegmon with abscess formation. If some of the larger vessels are involved there may be the formation of a hematoma, hemorrhage, suppurative thrombo-phlebitis or hemothorax. A contusion of the musculature leads to lameness, intermuscular phlegmon, abscess formation, and in rare cases fistula formation. A contusion of the bone may lead to fracture, fissure, necrosis and fistula formation. There may be contusions of the large nerve trunks leading to paralysis. Perforating wounds of the thorax may give rise to pleuritis, pneumonia and pneumo-thorax.

**Treatment**—The treatment consists in the arrest of the hemorrhage, drainage and antiseptic irrigation for contusions, or Priesnitz packs and liniments. It very seldom occurs that this class of wounds need to be sutured.

Wounding of the thoracic wall may be quite common from accidental injuries. These wounds are classified as perforating and non-perforating. The non-perforating wounds involve the skin, subcutis and bone. These may lead to various wound infectious diseases, as phlegmon, malignant oedema, etc., or fractures, abscess formation and fistula. The

perforating wounds lead to pleuritis, collapse of the lung, pneumonia, pneumo-thorax, hemato-thorax and internal hemorrhage as the result of the rupturing of a large artery.

**Treatment**—The treatment consists of sponging or irrigating with astringent antiseptics. The probe should never be used in these wounds, to determine the depth and position, as this may lead to a perforation. If the wounds are ragged and deep, a few drachms of iodoform ether should be injected into the wound, twice or three times daily. If the wounds are quite superficial they may be dressed with the ordinary dusting powders.

In cases of empyema of the thoracic cavity, the wound should be made large enough to have complete drainage. Then the entire cavity should be irrigated with mild antiseptic solutions, as potassium permanganate, sodium bicarbonate, boric acid, etc.

### Rupture of the Seratus Magnus.

Rupture of the seratus magnus is seen in the horse and usually occurs in runners.

**Symptoms**—The symptoms consist in a sinking of the body between the shoulder blades. The shoulder blade in some cases will extend four to six inches above the spines of the dorsal vertebræ.

**Prognosis**—The prognosis is as a whole unfavorable.

**Treatment**—The treatment is almost worthless and if the animal is not very valuable it might better be destroyed. Very valuable animals may be treated in the following way: A sling belt should be used that will reach from the point of the sternum to the hind flank. In this there should be some openings, which will allow the front legs to pass through the belt. Then the animal must be slung in this, and all of



the weight of the trunk must be removed from the limbs. The legs will fall into proper position and healing takes place in about three weeks.

### Shoulder Abscesses.

This condition is nearly always seen in draft horses as the result of an injury by pressure from the collar, and in running horses as the result of an injury due to violent exercise. A so-called cold abscess has reference to an encapsulated muscle abscess in the mastoido-humeralis muscle, while a chronic suppurative myositis is the most common form seen in practice.

**Cause**—This is caused partly by pus cocci and partly by botryomyces fungi. About twenty per cent of these abscesses are due to botryomycotic infection. This infection is carried into the tissues through skin wounds. After passing through the skin these bacteria are taken up by the lymph stream and carried to the intermuscular lymph glands and from there to deeper lymph glands (axillary glands).

A subcutaneous abscess due to a circumscribed phlegmon may appear under the same symptoms as a so-called cold abscess. In rare cases tumefactions may appear under the same symptoms as a cold abscess. A suppurative lymphadenitis or a tubercular lymphadenitis may be mistaken for a cold abscess.

**Symptoms**—The symptoms of a cold abscess begin with the appearance of a tumefaction at the point of the shoulder. This tumefaction is cold and almost painless. After weeks and months of development it may attain the size of two fists. The skin becomes attached to the tumefaction in its center and is movable over the rest of it. The skin also becomes firm in consistency and thickened. In rare cases it shows a tendency to become necrotic. These tumefactions

as a rule are not movable in the tissues, but in rare cases may show a tendency to move. On palpation it appears that these tumefactions have become attached to the mastoido-humeralis muscle. These abscesses are generally firm in consistency and very rarely have a fluctuating spot on the surface. In some cases it has been noticed that these abscesses have a tendency to undergo calcification and on palpation a firm object may be felt, which will resemble a foreign body.

**Prognosis**—The prognosis is favorable.

**Treatment**—The treatment of this condition consists in incising as soon as possible and evacuating the contents. A long incision should be made in a downward direction the full length of the tumefaction. This incision must be deep enough to thoroughly open and drain the abscess. If necessary some of the musculature should be removed from the sides of the wound to allow drainage and treatment. The capsule should be curetted, scraped or excised, and then the entire wound treated as an open wound, with antiseptic irrigation and dusting powders. These wounds usually discharge copiously and heal after about one month.

## SHOULDER FISTULA.

### Fistula of the Withers.

This condition is brought about by an injury, usually by rolling or rubbing of the saddle or harness. This injury involves the skin, subcutis and musculature in the region of the withers. Severe injuries also involve the fascia, synovial bursa, vertebral processes, the scapula and cartilage of prolongation. If the lesion is in the skin it is usually due to contusions of the first and third grades with a resulting hemorrhagic infiltration and inflammation. If the lesion is in the subcutis it is nearly always due to contusions of the

second grade with a resulting hematoma formation, bloody suffusion or an extravasation of lymph. Aseptic cases of this kind lead to encapsulation and organization of the hematoma. Cases that become infected lead to subcutaneous phlegmon and necrosis of the subcutaneous connective tissue. If the lesion is in the musculature or the fascia, it consists in a bloody suffusion, and if infected may lead to inter-muscular or subfascial phlegmon with necrosis of the fascia and muscles. The synovial bursa, if injured, may show such changes as acute bursitis or chronic hydrops; if it becomes infected it will lead to a suppurative inflammation. The processes of the vertebræ as the result of this suppurative inflammation usually undergo necrotic changes.

**Cause**—The causes of this disease may be predisposing and immediate. The predisposing causes are those of high prominent withers, or the angle of the shoulder may be too straight or very oblique. An abnormally thick and heavy shoulder seems to be most commonly affected. The immediate causes are those of injuries and contusions of various grades. The collar may be at fault or the animal may roll on a foreign body, or be cast in a narrow stall, etc.

**Symptoms**—The symptoms are made manifest by the appearance of a tumefaction apparently due to a contusion. This usually comes on very suddenly, that is, from two to three hours after the injury. This tumefaction is either cutaneous (that is, sharply defined and hard), or subcutaneous (that is, the swelling is diffuse, soft and often fluctuating, especially if there is a hematoma). A hematoma is cold and painless, while a phlegmonous swelling is hot and painful. The infection causes either a subcutaneous, intermuscular subfacial phlegmon or suppurative bursitis and dermatitis. A true fistula in this region is a subfascial phlegmon. The skin in this region is usually swollen and shows cutaneous lymphangitis. Next we find the appearance of a fistulous

canal, at the base of which there are soft, discolored granulations. In some cases there is gravitation of pus between the scapula and the vertebræ. In other cases there may be a septic phlegmon produced which will cause a fatal septicaemia. When this disease assumes a chronic form there are usually one or more small fistulous openings, which discharge a greenish pus profusely. These openings are small and round, with smooth edges, and the canal or tract which they expose is also smooth and well defined. The surrounding tissue usually becomes indurated, swollen and slightly painful. There is considerable pain shown when great pressure is exerted on the part.

In the aseptic form resolution usually takes place quite readily. In infected cases there is either encapsulation with organization or abscess formation and necrosis. This latter may lead to phlegmon, abscesses, necrosis of the musculature, the fascia, and the bones as well as septicaemia.

**Prognosis**—The prognosis is usually quite favorable in aseptic cases, and unfavorable in the cases that become infected, especially if there is a tendency to necrosis.

**Treatment**—The treatment of the aseptic form consists in massage, moist heat, counter irritation and eventually strong blisters. Cases of encapsulated hematomas or hygromas should be punctured or incised under strict aseptic precautions. It is usually advisable not to incise this form until everything possible has been given a fair trial so that a positive diagnosis can be made.

The treatment of the suppurative form consists in incising as early as possible. These incisions should be made long and deep and all necrotic areas carefully removed. The wound must have perfect drainage and then be irrigated with astringent antiseptics and covered with a dusting powder. These cases do not yield to treatment readily and it is generally advisable to use escharotics. These are slower in



action and in most cases give more satisfactory results. If after using escharotic paste the wound does not granulate properly it should be painted with five per cent solution of zinc chloride or equal parts of tincture of iodine and carbolic acid. Along with this bacterins should be used.

It is very rarely advisable to pack these wounds, but they should be treated as open wounds and be allowed to heal by second intention. Such escharotics as zinc chloride, arsenic and sanguinaria are used most commonly in these cases.

### Fracture of the Ribs.

Fractured ribs are seen most commonly in horses, less often in cattle and dogs. These fractures are mostly simple or fissured, but may be periosteal, green stick and compound. Usually in practice several ribs are found to be fractured.

**Cause**—The cause of fracture of the ribs is usually some injury from the outside, but such diseases as osteomalacea, rachitis, sarcomas, tuberculosis, actinomycosis or glanders lesions affecting the bone seem to be predisposing factors.

**Symptoms**—The symptoms of fractured ribs differ greatly. A great many cases are not diagnosed and heal without showing any noticeable symptom. (These cases are seen only on post mortem.) A fracture can usually be detected by a local swelling which is circumscribed and painful; in some cases crepitation can be felt, but this is not constant. If the fractured rib has punctured the pleura or the lung there are symptoms of pleuritis, pneumonia, hemorrhage, subcutaneous emphysema, and in rare cases pneumo-thorax. A fractured rib may wound the diaphragm, peritoneum, stomach, bowels, liver and spleen. It may also lead to a fatal internal hemorrhage as a result of rupturing one or more of the costal arteries, the heart or the internal thoracic artery. A compound fracture will generally lead to the formation of

a fistula. A fracture of the first ribs may lead to severe lameness and show no other symptom.

**Prognosis**—The prognosis is favorable if uncomplicated.

**Treatment**—The treatment is to keep the animal as quiet as possible in simple fractures. In compound fractures the wound must be treated antiseptically. In case the healing will form a very large callus and be unsightly, it may be painted with tincture of iodine and massaged.

### Fistula of the Ribs.

The most common cause of this is compound fractures in which there is necrosis of a small piece of bone, with the formation of a sequestrum which becomes encapsulated. It may also occur from suppurative phlegmon and shoulder fistula in which there is gravitation of pus. This gravitation of pus attacks the periosteum, and then the bone, leading eventually to the formation of a fistula. This condition has been known to occur by metastasis in such diseases as glanders, distemper, actinomycosis and tuberculosis.

**Symptoms**—The symptoms of fistula of the ribs are made manifest by a small round opening which discharges pus persistently. This opening is constructed with very smooth and hard edges. The surrounding tissue is usually swollen a little, but not very severely. By passing the probe into the fistulous canal a sequestrum of bone can usually be felt.

**Treatment**—The treatment consists in curettement and antiseptic irrigation. In case of sequestration, remove the necrotic area and give the wound good drainage. If the fistula has been of long standing it may be necessary to remove the periosteum and curette the bone or resect a portion of the rib.

### Sternal Fistula.

This condition is seen mostly in the horse and consists in a necrotic chondritis with sequestrum formation of parts of the sternum. This leads to the formation of a fistula, with a sclerosis of the subcutaneous, periostial and intermuscular connective tissue. This condition is usually the result of contusions but has been known to occur by metastasis in glanders.

**Symptoms**—The symptoms are the appearance of a fistulous opening on the sternum, which constantly discharges more or less pus or necrotic material. The surrounding tissue is very hard to the touch. In severe cases of long standing the animal becomes more or less emaciated. In rare cases it may cause a slight lameness. These fistulous canals are usually of great length.

**Treatment**—The treatment consists in giving good drainage, antiseptic irrigation and removal of all necrotic areas. This is most easily accomplished by the use of escharotic paste. The sclerotic portion surrounding the fistulous canal must also be removed the entire length of the canal. If healing is retarded, tincture of iodine or a five per cent solution of silver nitrate may be used. After removal of the necrotic areas and sclerotic portion it may be treated as an open wound.

## DISEASES OF THE ABDOMEN.

### Wounds.

Superficial wounds in this region are generally the result of contusions, and involve the skin, subcutaneous tissue and the superficial musculature. These wounds are mostly punctures, contusions and tearing of the skin. They may also

be due to bites. The most common wound infection disease seen here is phlegmon. This is either subcutaneous or inter-muscular which has a tendency to become necrotic. This condition consists in a profuse swelling, which is hot and painful and has a tendency to abscess formation. In rare cases this may undergo resolution. It very often happens that we find very large encapsulated abscesses on the abdomen, which are very similar to those seen in the region of the shoulder. Fistula, suppurative peritonitis or septic phlegmon do not appear commonly in this region, but if they do appear they lead to death very rapidly.

A contusion in this region usually leads to a bloody effusion, a hematoma or the rupture of a muscle, with a resulting hernia. This form of hernia, which is seen as the result of muscle rupture, usually becomes encarcerated and leads to death.

**Treatment**—The treatment of these superficial wounds consists in stitching the skin if necessary, remove all ragged edges around the wound, give good drainage and irrigate with some astringent antiseptic. Phlegmons should be treated with moist heat, Priesnitz packs, antiphlogistine, camphor ointment, etc. If this phlegmon becomes chronic apply blisters or paint the surface with tincture of iodine. Abscesses must be incised. This should be done most carefully, as a deep incision may lead to a hernia. A probe point bistuory and guide probe should be used in opening a hematoma or abscess in the region of the abdomen.

### Perforating Abdominal Wounds.

These wounds are divided into two classes: Those allowing the mesentery and viscera to protrude, and those which do not.

A simple wounding or injury to the peritoneum is not a serious thing, unless there is some infection carried into the



wound. The peritoneum of horses seems to be most susceptible to infection of various kinds. The peritoneum of other animals does not seem to be so susceptible, while the peritoneum of the dog is the least susceptible. There are some common operations in practice which involve the peritoneum, as castration, both ordinary and cryptorchid, laparotomy for various causes, and puncture of the viscera in flatulency. Ordinarily these operations are carried out under strict asepsis, and there are no bad results following, but perforating wounds with infection are always serious and the prognosis is always grave. Perforating wounds with infection usually lead to peritonitis.

**Treatment**—The treatment of these wounds is careful washing with disinfectants and suturing. Iodoform ether should be used in these cases, very freely before suturing. If the wound is in the form of a contusion, and there is some danger of a muscle rupture with hernia, a stout bandage or truss should be applied over the region affected, after the wound has been covered with ariol paste or gauze to prevent the entrance of infection.

Perforating abdominal wounds with a prolapse of omentum or mesentery are not always so grave as might be thought. The supposition is that the prolapsed portion fills the wound and seals it, keeping out all infection.

**Treatment**—In treating these wounds the prolapsed omentum should never be returned, but should be drawn out a little and removed with a pair of scissors as far up as possible. Great care should be exercised so as not to allow the infected portion of it to be taken back into the abdomen, as this may lead to infection. This should be done only after the most antiseptic precautions have been exercised. The wound should be cleansed first, then iodoform ether applied, and finally the skin wound may be sutured and covered with ariol paste. In some cases these wounds are so large that

it may become necessary to pack them with gauze before suturing. In cases of prolapse of the omentum following castration the prolapsed portion must be removed and not returned.

Perforating abdominal wounds with a prolapse of the viscera is always a serious matter. The prognosis should always be made with care.

**Cause**—This condition is brought on by such operations as cryptorchid castration, ordinary castration, spaying mares through the vagina and spaying bitches. In this latter case it is usually the result of improper suturing, and as a result the stitches tear out, allowing the viscera to prolapse. The animals affected will usually injure the viscera by treading on it, biting it and dropping on the ground. This leads to gangrene of the prolapsed part and allows the infection to enter the abdominal cavity.

**Treatment**—In treating these cases great care must be taken to have everything perfectly aseptic and clean. If the viscera has come in contact with the ground, or if gangrene is present, the case is hopeless and reposition is of no avail.

### Intestinal Fistula.

This designates an opening of the lumen of the bowel which connects itself with the skin, causing the lumen of the bowel to be communicated with the external air. This fistula constantly discharges pus and intestinal contents. There is generally more or less adhesive peritonitis in the region surrounding the opening, which causes the wall of the intestine to become adherent to the abdominal wall.

**Cause**—This condition is most commonly caused as a result of puncturing with a filthy trochar, but may be due to perforating wounds of any kind, perforation of the lumen

of the bowel by foreign bodies in the intestinal tract, necrosis in hernias or as a result of ovariectomy.

**Treatment**—The treatment of this condition consists in cauterization, curetting and draining the fistulous tract. This should be followed by astringent antiseptic washes.

In the ox there is frequently found a fistulous tract connecting the reticulum with the skin. This results from a sharp object in the reticulum pushing its way outward and as a result causing a fistula to form. This condition is also known as a "cold abscess" and is treated in the same manner as intestinal fistula.

### Umbilical Hernia.

This condition is seen most commonly in horses and dogs. There is usually a rent in the abdominal floor in the region of the umbilicus, causing the hernia to form. This form of hernia contains small intestine and mesentery; however, they have been known to contain a small portion of the large intestine. These hernias consist of a mouth, an outer sack which is made up of skin and an inner sack which is made up of peritoneum. The hernial mouth is usually made up of the umbilicus which has not properly healed. This form of hernia comes on very early in life, while the new formed connective tissue in the umbilical region is very soft and breaks easily.

**Symptoms**—The symptoms of this condition consist in a round or oval, circumscribed, soft, painless swelling in the umbilical region, which is easily reducible by pressure. In the horse this condition may vary in size from a bantam egg to a man's head in severe cases. In dogs it is usually the size of a hazel nut. As a rule the general condition of the animal is not affected and it very rarely happens that an umbilical hernia will become incarcerated.

**Prognosis**—This condition is not looked upon as a serious disease, but more as a blemish or malformation, which under ordinary conditions is easily removable.

**Treatment**—In very young animals the treatment is mainly expectative. In a great many cases this condition will disappear without any treatment as the animal grows older. The palliative treatment consists of irritations and bandages with plenty of massage. If the hernia is small it may be painted with nitric acid, or it may be blistered with the ordinary blistering agents. These agents have a tendency to cause swelling, which presses the bowel back into the abdominal cavity and by irritation causes the hernial ring to heal over. Another common method of treatment is to tie off the hernia or inject normal salt solution in the region of the hernia. Of the last mentioned methods a ligature is probably the most convenient. For this a long needle with a stout double thread is used. With the animal on its back, and the contents of the hernial sack in the abdominal cavity, proceed as follows: Draw up the hernial sack as tightly as possible and pass the needle in the center of the sack as close to the body as possible, then tie each way, taking care to draw the thread very tight. This will set up a great deal of irritation and cause the sack to slough, leaving a smooth cicatrix behind. The objection to using clamps is the fact that they may fall off or be accidentally removed before healing takes place; this will allow prolapse of the viscera and death following.

The radical treatment for this condition is operative. The most successful operation is performed as follows: Make an incision through the skin down to the peritoneum, push the peritoneum back into the abdominal cavity, expose the hernial ring about one inch back from the edges, scarify the edges and suture with a double row of sutures, drawing the free end of the hernial ring together. Then suture the skin



and if necessary remove a portion of the skin so that the edges may be brought in close opposition. If the hernia is quite large this operation should be followed by a stout bandage applied around the body to remove the weight while healing. Complete healing usually takes place in about two weeks.

### **Inguinal and Scrotal Hernia.**

Inguinal hernia is the result of bowel or mesentery passing through the internal inguinal ring into the inguinal canal. A scrotal hernia is about the same condition, except that the mesentery or bowel pass down through the canal into the scrotum. A scrotal hernia is the most common condition seen in ordinary practice. This condition usually occurs in young stallions, bulls and dogs.

An inguinal hernia is often seen in geldings of any age.

**Cause**—The cause is either a congenital malformation of the internal ring, causing it to be quite large, or an acquired enlargement of the internal ring due to hard pulling, straining while at work, or if in a case of colic the animal becomes tympanitic the ring will become enlarged. This condition has been known to follow galloping, running, backing the animal with a heavy load, etc. As a general rule acquired hernias are inguinal, while congenital hernia is usually scrotal.

**Symptoms**—A scrotal hernia usually contains both bowel and omentum and usually occurs unilateral, but may be bilateral. The hernia itself is recognized by a soft, painless enlargement of the scrotum. This swelling is hot and disappears on a little pressure. By carefully palpating this region an enlarged inguinal canal and internal ring may be felt. By rectal exploration this fact is quite readily proven. Ordinarily this swelling is the size of a man's fist, but it may become very large. This form of hernia is the most common

in dogs and swine and may become exceedingly large. There are no general disturbances in scrotal hernia, as they very rarely become incarcerated. An analogous hernia is seen in bitches just posterior to the udder.

A true inguinal hernia is usually unilateral and most commonly seen on the left side. The contents are usually small intestine. These hernias in horses are usually the size of a hen egg and in dogs about the size of a pigeon egg. This form of hernia is usually easy to replace by palpation and rectal exploration, except when it becomes incarcerated. So long as this hernia does not become incarcerated there are no general disturbances and the animal does not seem to be affected. There may be a slight straddling gait, but this is not common. Inguinal hernias have a tendency to become incarcerated and then they give rise to very grave symptoms, which frequently lead to death. Usually an incarcerated hernia does not give rise to any symptoms until it has run a course of from twelve to fifteen hours.

**Symptoms**—The symptoms are those of colic; if the loop of bowel becomes necrotic the pain is constant, pulse thread-like and temperature subnormal. Along with this there will be seen some symptoms of peritonitis. The local symptoms are a swelling which is very painful. This swelling frequently becomes very large. On motion the animal either straddles or is quite lame. On rectal exploration a loop of bowel is found to enter the internal ring. This method should always be used to prove the diagnosis.

**Treatment**—The treatment of scrotal hernia in foals is often useless, as this condition readily rights itself as the animal grows older. In case it does not, it may be treated in the same manner as scrotal hernia in adults.

The treatment for scrotal hernia in adults depends upon the following point: Is the animal too valuable to be

castrated? If he is a valuable animal he may be made into an artificial ridgling or if unilateral may be castrated.

The most suitable method of operating for animals that may be castrated is the so-called covered operation. This is performed as follows: Make an incision through the skin onto the tunica vaginalis. Strip the skin from the tunica vaginalis as far as possible, then cut through the tunica vaginalis, remove testicle, and tie off the tunica as far up as possible. This is done most easily with a curved needle and a double thread. Pass the thread through the center and tie both ways as tightly as possible. Then cut the tunica vaginalis about one-half inch from where it is tied off. After thoroughly cleansing the wound pack with cotton and suture the skin wound. In case this method is not readily carried out, the animal may be castrated and the canal well packed with cotton dipped in a one per cent solution of creolin or permanganate of potash. In doing this care must be taken so that the entire canal is well filled up to the internal ring. This will usually set up enough inflammation to cause the canal to be obliterated. A horse that is too valuable to be castrated may be treated in the same way, except that the testicle should be pushed into the abdominal cavity instead of being removed, then pack the canal.

The treatment of either scrotal or inguinal incarcerated hernia consists in giving some hypodermic cathartic, which will cause peristalsis, then manipulate the scrotum and inguinal region with one hand and by means of the other hand in the rectum use taxis on the incarcerated loop of bowel. In this way it usually can be relieved. It is a great deal more convenient to cast the horse for this operation and in some cases it becomes necessary. If the condition cannot be relieved in this manner an operation may be resorted to, which is performed as follows: Incise the skin and subcutaneous tissue and then carefully open the tunica vaginalis,

and by manipulation return the loop of bowel. If the incarcerated portion has swollen it is necessary to slit the internal ring with a probe pointed bistuory to return the loop of bowel. This incision will usually cause enough swelling to cause the internal ring to be obliterated and prevent the formation of another hernia; then return the tunica vaginalis and the skin. Sometimes it becomes necessary to perform the covered operation with castration (the same as scrotal hernia).

### Hernia Ventralis.

This condition is seen mostly in dogs, cattle and horses in the above order. The most common cause seems to be lacerating wounds, contusions with a tearing or rupturing of the subcutaneous musculature. This condition is very rarely seen as the result of excessive contraction of the abdominal muscles, but has been known to occur in pregnant animals as the result of spontaneous muscle rupture. The hernial sack of these hernias is usually not very well developed and consists mainly of skin. The contents are usually large or small intestine, uterus, liver, and in some cases mesentery or bladder. In cases where this condition becomes chronic, the contents of the hernial sack usually become attached to its walls.

**Symptoms**—The symptoms of ventral hernia in the acute stages consist in a painful, hot tumefaction, associated with more or less oedema. The oedema surrounds this tumefaction, and therefore it is almost impossible to palpate the mouth of the hernia and make a positive diagnosis. After the disappearance of the acute symptoms and the oedema, the characteristic symptoms of the hernia appear. On palpation the mouth of the hernia may be felt, and the contents can be pushed back into the abdominal cavity. These hernias do not have a tendency to incarcerate and practically never lead to any serious symptoms unless they become very large.



A hernia of the uterus is usually very large and in some cases the tumefaction may reach nearly to the ground.

**Treatment**—The treatment of acute ventral hernia is palliative. A great many cases return and heal without any treatment. In acute cases cold applications and astringents should be given a good, fair trial before an operation is resorted to. Great care should be exercised in diagnosing this condition. It is frequently taken for an abscess or hematoma, and an incision is made. Cases of long standing in which there is a large opening are practically incurable. Bandages and massage give some relief. If a proper diagnosis has been made an operation may be resorted to, by cutting through the skin onto the peritoneum, separate the peritoneum from the musculature, suture the musculature as tightly as possible with heavy cat-gut, cover with iodoform ether and suture the skin.

#### **Diseases of the Rectum.**

Mechanical irritations to the rectum in horses is a very common condition. They are the result of irrigation, injection, infusion, as well as the entrance of foreign bodies, and prolapsus recti. Such internal cases as foreign bodies, a partial rupture during parturition or spontaneous rupture due to excessive muscular contraction are of importance.

Superficial irritations or lacerations to the mucous membrane give rise to bleeding. The blood may be seen on the feces or passed as such, or may be seen on the hand after rectal exploration. Later on there are symptoms of proctitis. Contusions of the periproctal connective tissue give rise to phlegmon, abscess and fistula formation with a septic infiltration in the region of the rectum from below, that is through the vagina, usually leads to the formation of a fistula, uniting the rectum and vagina. Injuries to the forepart of the rectum

lead to septic peritonitis and if perforated rapidly lead to death.

**Treatment**—The treatment for perforations of the rectum is useless, as these conditions are incurable. Superficial contusions are treated with warm antiseptic infusions into the rectum. Periproctal abscesses should be opened as early as possible.

### Proctitis.

This is an inflammation of the rectum and is usually brought on by some mechanical irritation as foreign bodies, or rectal injections of irritating substances as chloral, hot water or cantharides. It may also be due to prolapsus recti, fracture of the pelvis, following specific infectious diseases as influenza, anthrax, dysentery, distemper in dogs or metastatic periproctal abscesses.

**Symptoms**—According to the cause there may be the following forms: Catarrhal, diphtheritic, suppurative, parenchymatous, phlegmonous and hemorrhagic. The main symptoms are straining, painful defecation, impaction, a croupous, diphtheritic hemorrhagic or suppurative coating on the feces. By examining the rectum manually the proctal mucous membrane is found to be swollen, hot and reddened. In cases of phlegmonous proctitis there are large phlegmonous swellings.

As a result of the excessive straining in this disease there may be a prolapse of the rectum with necrosis of the mucous membrane, peritonitis or fistula formation.

**Treatment**—The treatment consists in manual removal of the irritating substances, followed by antiseptic astringent clysters. These clysters should contain some mucilagenous or oily material. Periproctal abscesses should be incised as early as possible.

### Prolapsus Recti.

In diagnosing this condition, care must be taken to differentiate between prolapsus and prolapsus recti. In prolapsus recti there is the prolapse of all or a part of the rectum through the anus. It may occur that along with this there is an invagination of the abdominal portion of the rectum with the pelvic portion, with a prolapse of the invagination. If this invaginated portion contains a loop of small intestine it is known as hernia recti.

**Cause**—The causes of this condition are usually predisposing, and it is seen mainly in young dogs and swine as well as horses. There seems to be congenital weakness of the sphincter and the periproctal connective tissue. This, along with diarrhea or constipation, causes a prolapse. Gastric catarrh, difficult parturition, excessive straining in defecation and colic may be followed by this condition.

**Symptoms**—The symptoms are those of a various shaped tumefaction passing through the anus. On the end and usually through the center of this tumefaction an opening can be found which exposes a canal. If the tumefaction contains small intestine it has a tendency to point upward, otherwise it points downward. In acute cases there is no change in the condition of the mucous membrane, but in cases of long standing there is stasis of the venous circulation, oedema and gangrene of the mucous membrane. Very chronic cases may contain excoriations, ulcers, hemorrhagic areas and necrosis, which gives rise to a general septic infection and peritonitis.

**Treatment**—The treatment of this disease is usually very effective, if the general condition of the animal is not affected. It consists in dissecting the necrotic mucous membrane from the muscular coat. This is best done with the forefinger and thumb. After this has been removed the parts should be thoroughly cleansed, lubricated and returned. Give the animal

laxative diet and keep quiet for several days. In some cases it becomes necessary to amputate the prolapsed parts, it is best to pull out the prolapse as far as it is affected. Then with a needle and thread pass through the center from side to side and from top to bottom. Remove the prolapsed portion with a pair of scissors and there will be eight sutures to tie. Tie these and if necessary add a few more. If this method is not found convenient, a piece of tubing can be taken the exact size of the rectum. After being well cleansed and lubricated, it may be passed into the rectum until its center is up to the anus. Now a stout thread may be passed around the invagination portion to the tubing. The prolapse may be removed with a pair of scissors and healing usually takes place in three to four days. The tubing must be held in position until healing takes place, and the animal must be kept on a laxative diet and the wounds treated with antiseptic astringent washes and dusting powders. Various astringent ointments will be found very serviceable, especially those containing opium or some other agent that will act as a local anodyne.

#### **Fistula of the Rectum.**

A fistula of the rectum is not common in the domesticated animals, but may result from a periproctal abscess or penetrating wounds from the outside. There are two forms of this, these are complete and incomplete. In the complete form there are two openings, one in the rectum and one in the skin. In the incomplete form there is but one opening, and that is in the skin. This form of fistula is very nearly incurable, and should be treated with escharotics, iodoform ether, astringents, bacterial vaccines and antistreptococcic serum.

#### **Stenosis of the Rectum.**

A stenosis of the rectum may occur as a result of an injury causing a stricture, or as a result of a cicatrix, or it may



be caused by various new formations as sarcoma, carcinoma, hematoma, abscess, tumefaction of the prostate, concrements, or in some cases there has been found a congenital stenosis.

**Symptoms**—A stenosis may give rise to impaction, colicky symptoms, excessive straining followed by rupture of the rectum, and eventually peritonitis.

**Prognosis**—If this condition is due to stricture from cicatricial contracture it is incurable; if it is due to some other cause, the cause may be removed and the rectum treated accordingly.

**Treatment**—There is no specific treatment for this ailment.

#### **Paralysis of the Rectum.**

Paralysis of the rectum is seen mostly in dogs, less often in horses and is usually due to some lesion in the spinal cord. It may follow an infectious or contagious disease. This condition is usually accompanied by a paralysis of the bladder and tail as well.

**Symptoms**—The symptoms consists in difficult defecation, the feces being passed only in small quantities, and later on in the course no feces are passed at all. As a result of this there is impaction and colic.

**Prognosis**—The prognosis should be guarded.

**Treatment**—The treatment consists in areolin, strychnin, manual removal of feces and plenty of liquid food.

#### **Calculi in the Bladder and Urethra.**

The calculi which are found in the urinary tract of domestic animals usually occur in the bladder, while in geldings

they may be seen in the urethra at a point where it passes over the pelvic arch.

**Causes**—The causes of these formations are usually such diseases as pyelitis, pyelonephritis, cystitis, an excessive amount of various salts in the urine, or bacteria in the bladder, which cause a decomposition of the urine with a precipitation of its salts.

**Symptoms**—The symptoms of this condition are not noticed unless the calculus becomes very large. Then they give rise to dysuria, hemorrhagic, catarrhal, suppurative, or diphtheritic cystitis. These calculi can be palpated through the rectum. If they become lodged in the urethra they cause a stoppage in the passage of urine, and give rise to straining with the passage of small quantities of urine and blood. As a rule the calculus can be felt and easily removed. A damming up of the urine may lead to serious symptoms with rupture of the bladder and peritonitis.

**Prognosis**—The prognosis is usually favorable.

**Treatment**—The treatment consists in performing lithotomy through the urethra (in geldings) with removal of the calculus. If the calculus is in the bladder, in a gelding pass a catheter, and at the pubic arch cut through the urethra, and by means of forceps pass into the bladder and remove the calculus. In a mare incise the meatus urinarius and pass forceps into the bladder. It may be that the calculus must be crushed before it can be removed. After operating suture the urethra to the skin, and after three days remove the sutures allowing the wound to heal by second intention.

### **Cryptorchidy.**

The term cryptorchid signifies a retained or hidden testicle. Technically we understand by this term a condition whereby

the testicle remains in the abdominal cavity and does not make its descent into the scrotum. When the testicle is retained in the inguinal canal, it is known as an inguinal cryptorchid (flanker). As a rule this condition is congenital and only one testicle is retained. This is known as monorchid and generally appears on the left side. This condition appears mostly in coarse bred horses and swine.

**Cause**—The cause of this condition has never been definitely demonstrated. The supposition is that the development of the organ is very slow, the cord is short, the canal is narrow, and as a result the testicle remains free in the abdominal cavity.

In a case of an abdominal cryptorchid, the testicle is always found free in the abdominal cavity and as a rule in the region of the internal inguinal ring. On the affected side there is no appearance of a scrotum.

In a case of an inguinal cryptorchid the testicle is found in the inguinal canal, and the coverings of the testicle are present. It may occur that the testicle is in the abdominal cavity, but the epididymus will be in the inguinal canal and covered over with coverings of the testicle.

The retained testicle is usually smaller and softer than the normal testicle. It is usually flat or fig shaped. The fact that the testicle may be covered over with small filaments and attach itself to the wall of the abdomen has been known to occur. It may happen that occasionally the testicle is exceedingly large, this being due to cyst formation or some new formation within its substance. A condition in which there is but one testicle present may exist; this is known as aplasia. The spermatozoa which are secreted by a cryptorchid testicle are usually very small and rarely fertile.

**Symptoms**—The symptoms of this condition is the failure of one or both testicles to appear in the scrotum. In this condition there is usually great sexual excitement and a viscous

disposition and temperament, which is manifested by kicking, striking and biting. These animals also show less development of the croup and buttocks than normal animals.

**Diagnosis**—The diagnosis of cryptorchid is made by palpation externally and by rectal exploration. Usually a combination of the two is sufficient. In flankers, if the animal is cast and the hand passed as far up the canal as possible, the testicle can usually be detected as a smooth round body. This condition is very hard to diagnose in rough built yearlings, as they have the power of drawing the testicle far up in the inguinal canal. To make a positive diagnosis rectal exploration must be resorted to. The testicle can be felt in the region of the internal ring. It is smooth, firm, movable, well defined, and feels somewhat like a sack containing mercury. If followed out to the cord the pulsation of the artery may be felt. Usually there will be a castration cicatrix on one side of the scrotum. This is not a positive factor, however, and can only be as a means of diagnosing, and not as a positive proof. Then these animals usually show great sexual excitement. If the animal be allowed sexual intercourse an ejaculation will be positive proof. If it contains spermatozoa this proves beyond a doubt that there is a testicle present.

### Operation for Cryptorchidy.

This consists in casting the animal in the dorsal recumbent position and securing the hind legs. An ordinary side line will not suffice for this operation. After the hind legs are well flexed and drawn outward, proceed to thoroughly cleanse everything. Next make an incision in the usual place as for an ordinary castration. This incision should be made quite large and only through the skin. Then with the hands tear the connective tissue and expose the external ring and the inguinal canal. Pass the hand down the canal to the internal



ring. This is covered with peritoneum, break through the peritoneum and the testicle will usually push through. If the testicle does not push through, pass the hand into the abdominal cavity. After the hand is in the abdominal cavity, pass the forefinger in a semicircle trying to catch the cord. This will usually locate the cord when the testicle can be drawn out. Remove the testicle with an emasculator in the ordinary way. In a great many cases it is not necessary to pack the wound, but it is good practice to pack the wounds for twenty-four hours. At the end of this time there is no more danger of prolapse of the viscera as the parts will be swollen and prevent this.

Some authorities state that this operation may be performed as follows: Make an incision over the external region in the crus. Then with the hands tear the connective tissue and expose the external ring. Pass the cone shaped hand in front of the inguinal canal, and rupture through in front of the internal ring. The objection to this procedure consists mainly in that it does not provide proper drainage and unduly injures the tissues by avoiding the inguinal canal. In the majority of cases the first method of procedure will be found most satisfactory.

### Orchitis.

Orchitis is due to traumatism and external injuries, or by metastasis following or occurring during the course of some infectious and contagious disease, as glanders, tuberculosis, pyemia and parasites. It may be that this inflammation is a periorchitis and not a true orchitis, for which it may be mistaken.

**Symptoms**—The symptoms of acute orchitis are a firm painful swelling of the testicles, and in some cases this also involves the epididymus. Then there may appear stiffness, lameness, colicky symptoms, and some general symptoms as

fever. It very rarely happens that there is abscess formation or necrotic processes present in the testicles. Chronic orchitis is made manifest by a firm, painless swelling of the testicles. As a rule, it is due to interstitial orchitis following tuberculosis or glanders with caseation or calcification within the testicle itself or the testicle may contain an atheromatous cyst.

A periorchitis involves the serous coverings of the testicle and may be serous (hydrocele) or adhesive.

**Treatment**—The treatment of orchitis consists in removing the weight, by having the animal wear a suspensory. Then apply moist heat in the form of warm water, antiphlogistics followed by liniments and ointments. Internally, in the acute cases, aconite and phytolacca should be given.

There may be such new formations in the testicles as sarcoma, sarcocele, fibrocarcoma, carcinoma, dermoid cysts, tubercular lesions and glanders lesions. These are made manifest by hard, painless swellings of the inguinal lymph glands. The treatment of this condition consists in castrating.

## DISEASES OF THE SPERMATIC CORD.

### Fistula of the Spermatic Cord or Schirrus Cord.

Fistula of the spermatic cord is generally the result of infection following castration. In a great many cases the ends of the cord are left so long that they hang in the wound and become infected. This condition involves not only the free ends of the cord, but the neighboring serous membranes and in some cases the scrotum. The most common infections causing this condition are botryomycosis, actinomycosis and ordinary pus cocci. An infection of botryomycotic origin is very common in horses and results from infected straw and bedding. After gaining entrance in the wound this infection

sets up a specific tumefaction, which is in part suppurative and in part an induration of the free end of the cord.

An infection of actinomycotic origin is very common in the ox, less common in the horse. The infection is carried by infected straw and bedding. An infection of staphylococci can also produce a chronic suppurative induration of the spermatic cord. There are certain predisposing conditions whereby this infection may gain entrance and find the proper media to grow. A very small castration wound seems to favor this, clamping instead of using an emasculator, and improper antiseptic precautions before and after the operation. Then the skin wound may heal too rapidly and enclose a sack of pus. This would lead to abscess formation with a resulting champagne.

**Symptoms**—The symptoms of this condition are noticed by the fact that the castration wound does not heal and discharges pus from a very small, round opening. This may be accompanied by a phlegmonous swelling which will apparently heal. By careful examination there is found a small, constricted, fistulous canal. It may happen that there is more than one fistulous opening. By palpation the cord is found indurated and the surrounding tissue swollen. The rapidity with which they develop varies greatly. Some only reach the size of a goose egg after a year of growth, while others attain the size of a man's head in two or three weeks growth. On the cut surface this tumefaction is grey in color and fibrinous. It also shows fistulous canals, which discharge a yellowish pus. Microscopically botryomycosis appears as greyish nodules somewhat like sand. If the case is of long standing there will be numerous large veins on the periphery as large as a man's finger, while the center veins are a great deal smaller.

**Prognosis**—The prognosis is generally favorable.

**Treatment**—The treatment of this condition consists in extirpation of the tumefaction. This is done by making an incision through the skin, then, with the hands, separate the tumor from the surrounding tissue, when the normal cord is exposed remove the entire mass with an ecraseur. It is best to treat the wound as an open wound in the ordinary manner.

### Hydrocele.

This is a serious inflammation of the coverings of the testicle and cord. It is properly known as periorchitis serosa.

In diagnosing a case of this kind four forms are to be considered, acute, chronic, diffuse and circumscribed, and these must be distinguished from each other. This serous fluid is either free and as such, or there may be small pockets formed which resemble cysts, which contain the serous fluid.

**Cause**—The causes of this condition are not accurately known. Some authors seem to think that it may be congenital, others think it follows castration in which the incision was very small and healing took place too early. It may follow a traumatic infection of the tunica propria. Various parasites may gain entrance to the tunica propria and give rise to a chronic serous inflammation. In very rare cases a hydrops of the tunica propria is seen in ascites. Sometimes castrating with clamps will lead to the formation of vaginal cysts.

**Symptoms**—The symptoms of chronic hydrocele consist in a soft elastic, painless swelling around the testicle and cord. In acute cases this may be painful and hot. This greatly resembles hernia, in acute cases, and great care must be taken in making a diagnosis. Vaginal cysts as the result of castration resemble a testicle and are soft and painless. A proper diagnosis can only be made with a trocar.

**Prognosis**—The prognosis is favorable.



**Treatment**—The treatment of hydrocele consists in castrating and making long free incisions at the point of castration. In case it is a vaginal cyst a complete extirpation of the cysts is necessary. This may be followed by painting with iodine or Lugol's solution. If the patient is a valuable stallion and castration is not advisable, puncture with a trocar and draw off as much fluid as possible. Then inject some Lugol's solution through the trocar. This should be followed by massage and astringent lotions applied externally.

Hematocoele is a collection of blood within the tunica vaginalis and is usually due to traumatism and may result in hydrocele. Varicocele is a dilatation of the veins of the spermatic cord forming a soft elastic tumor. This condition is frequently seen in cryptorchids and old stallions.

#### Diseases of the Scrotum and Sheath.

Wounding of the scrotum and sheath is very rare with the exception of castration wounds. Superficial wounds in this region heal very rapidly. Perforating wounds with infection in this region are usually quite serious as they lead to septic vaginitis and periorchitis. Perforations in this region which have become infected, should be opened with free incisions and well drained.

In dogs there may be seen an eczematous or suppurative inflammation of the skin of the scrotum as a result of traumatism or some irritating application. This may lead to a circumscribed necrosis but is very rare. This condition is very seldom seen in other animals.

**Treatment**—The treatment consists in antiseptic ointments as boric acid, ariol paste, etc.

A phlegmonous condition of the sheath may occur as the result of traumatism, castrations, or during the course of fistula of the spermatic cord. It is characterized by a firm

swelling, which is painful and warm, causing the animal to be stiff and lame.

**Prognosis**—As a rule the prognosis is good but may leave a thickening of the sheath.

**Treatment**—The treatment consists in opening the castrations wound so that it cannot retain the wound secretions, and removing the fistula or disinfecting and draining the wound, which is a causative factor.

### **Balanitis.**

In a great many geldings an inflammation of the inner surface of the prepuce is seen as a result of a collection of smegma. This is characterized by a smeary or crust like smegma on the inner surface of the prepuce which results in thickening, ulceration, sclerosis, and eventually stenosis of the prepuce. As a result of this condition there may be a blocking of the urethra causing dysuria, colic, cystitis, nephritis, or rupture of the bladder. If the condition causes a stenosis of the prepuce the urine passes from the urethra within the prepuce, and the penis cannot be protruded. This usually leads to an atrophy of the penis. An inflammation of the prepuce may result from petechial fever or some interference with urination.

**Treatment**—The treatment consists in carefully cleansing the prepuce and irrigating with creolin one per cent; formalin one-half of one per cent, and the application of some astringent antiseptic ointment. Stenosis is treated by incising the prepuce and extirpation of the cicatrix. Cases of atrophy of the penis are incurable.

Preputial catarrh is often seen in the dog. It consists of a catarrhal inflammation of the mucous membrane as the result of urination. The treatment consists in irrigation with zinc sulphate, alum, tannin, and boric acid solutions.

### Inflammation of the Prepuce in the Ox.

This is usually due to faulty urination and leads to a chronic inflammation with thickening and swelling of the prepuce. This inflammatory process leads to a stenosis of the prepuce and disturbances in urination as straining, or the urine is constantly passed in drops, colic, dysuria and rupture of the bladder. In very severe cases this may lead to a septic or necrotic phlegmon with gangrene and necrosis of the penis, infiltration of the surrounding tissue with urine, and septicæmia.

**Treatment**—The treatment consists in incising the stenosis and irrigating the prepuce with antiseptic astringent washes.

### Phimosis and Paraphimosis.

Phimosis is a condition in which there is a stenosis of the mouth of the prepuce which prevents protrusion of the penis and leads to disturbances as dysuria, and inflammation of the prepuce. As a rule this condition is acquired as a result of a cicatrix of some previous disease. It has been known to be congenital but this is very rare. This condition occurs most frequently in the ox, horse and dog.

**Treatment**—The treatment consists in incising and removing the cicatrix or a portion of the prepuce.

Paraphimosis is a condition in which the prepuce is so badly swollen that the penis is protruded and cannot be retracted. This condition is seen mostly in dogs and horses after castration when the swelling becomes very severe. It may also occur from contusions, wounds, tumefactions, etc.

**Treatment**—The treatment consists in manual reposition of the penis and massage of the prepuce. If it becomes necessary the prepuce may be incised. This should be followed by

thoroughly massaging and the application of astringent washes.

## DISEASES OF THE PENIS.

### Paralysis of the Penis.

**Cause**—The exact causes of this condition are unknown. It very rarely appears primarily, but is nearly always secondary to some other disease as chest plague, diseases of the spinal cord, fracture of the vertebræ, azoturia, thrombo-embolic colic, petechial fever, traumatism to the penis itself, injuries to the motor nerves in the penis, or following the castration of a cryptorchid.

**Symptoms**—The main symptom of this condition is a prolapse of the penis in which it protrudes from the prepuce. As a result of this it becomes injured and covered with excoriations, suppurative inflammatory processes, chronic phlegmon and in some cases it even becomes gangrenous. There are two distinct portions to the prolapsed penis. First the lower portion involving only the glans penis is a firm tumefaction. Above this and separated by a distinct furrow is a second part. This second portion is a round swelling which is sclerotic and involves mainly the connective tissue. These swollen parts prevent the penis from being retracted and lead to a paraphimosis. Urination is not interfered with as a rule. It often happens that there is a paralysis of the tail and crus along with a paralysis of the penis. If the paraphimosis becomes severe there may be oedematous swellings of the hind leg.

**Treatment**—The treatment of this condition is practically worthless, especially if severe and chronic. Such treatments as massage, electricity or injections of strychnine may be used, but the radical treatment consists in amputation. In amputating great care must be exercised so that there will not be a stricture of the urethra left. A long free incision in the urethra



with suturing the walls to the skin seems to be the most satisfactory.

There may be such new formations on the penis as carcinoma, sarcoma, endothelioma and angiosarcoma. These usually lead to an atrophy of the penis and necessitate its amputation.

#### Diseases of the Female Genital Organs.

Lacerations of the vulva are seen mostly after difficult parturition, as the result of rough handling, the rough use of instruments, large foetus or fractured bones of the foetus. These lacerations and bruises are usually in the form of excoriations or hematomas. There may be a laceration on the upper commissure, which may lead to the formation of a cloaca. Frequently these wounds lead to wound infectious diseases and puerpural infection. As the result of cicatricial formation there may be obliteration or stenosis.

**Treatment**—The treatment of these wounds consists in a disinfection and if possible suturing. If it consists in a hematoma this should be opened. If these wounds lead to puerpural infection they should be cauterized.

Injury to the vagina usually occurs as the result of difficult parturition, prolapse of the vagina, copulation, fracture of the pelvis, or the entrance of foreign bodies into the vagina. These wounds are either superficial or penetrating. If the perforation is in the abdominal cavity there may be a prolapse of bladder, mesentery or bowel, followed by septic peritonitis. Perforations on the upper surface usually involve the rectum and lead to the formation of a cloaca and recto-vaginal fistula. These wounds may also be followed by wound infectious diseases as phlegmon of the periproctal connective tissue, necrosis, puerperal septicaemia, pyaemia and tetanus. These wounds may be accompanied by a discharge, which is foul smelling as well as straining. As a result

of these wounds there may be cicatricial formation, leading to stenosis and in some cases obliteration with retention of pus and abscess formation beyond the obliteration.

**Treatment**—The treatment consists in antiseptic irrigation and tampons. Perforating wounds that become infested are necessarily fatal and usually treatment is not indicated. If there is a prolapse of mesentery do not replace but thoroughly cleanse and remove.

### Vaginitis.

This condition is seen most commonly in the cow, following difficult parturition and copulation.

**Cause**—It is partly due to traumatisms and partly to infection. It very rarely happens that chemical and thermic irritations cause this disease. The infection comes from the hands, instruments or from the uterus. In rare cases it may be carried by metastasis. Specific forms of vaginitis are seen in glanders, tuberculosis, dourine, and vesicular exanthema. In some cases vaginitis is seen to accompany endometritis and contagious abortion.

**Diagnosis**—In diagnosing a case of vaginitis the following forms are distinguishable: Simple, superficial, catarrhal, traumatic, suppurative, necrotic, diphtheritic, submucus, phlegmonous, chronic, hyperplastic, follicular, granular and varicose.

**Symptoms**—The symptoms of inflammation of the vagina are straining as if to micturate, discharging a slimy mass or in some cases this may be suppurative, necrotic, bloody or diphtheritic. The animal shows great pain when the parts are touched. When the animal strains, the back is arched and it shows pain. There is a reddening and swelling of the mucous membrane of the vagina. This may also be covered by blisters, vesicles, ulcers, or diphtheritic areas. In chronic

cases there are cysts, polyps and tumefactions on the mucous membrane. This disease may lead to stenosis and obliteration with a pus sack behind the stenosis. If this condition is due to puerperal infection, there are general symptoms and symptoms of sepsis.

**Treatment**—The treatment consists in astringent antiseptic washes and irrigation as creolin, lysol, alum, ichthyol, potassium permanganate, etc.

### Prolapse of the Vagina.

This condition occurs mostly in the ox, dog and swine, less often in the horse. It is usually seen in old cows of a lymphatic disposition, and those that have given birth to a great number of calves. It is also seen in younger animals as the result of excessive straining from any cause.

**Cause**—The causes are usually seen in the food and the stall. Stalls that are lower behind than before seem to predispose to this condition. It also occurs as the result of some nervous disorder. It usually occurs within the last two months of pregnancy or immediately following parturition. It has been seen to occur in young heifers and non-pregnant cows. Animals that are poorly fed seem to be affected mostly.

**Symptoms**—The symptoms of prolapse of the vagina are classified as partial and complete, acute, chronic, or habitual. An inversion of the vagina consists in the side walls and the upper portion of the vagina extending outward toward the lips of the vulva.

An incomplete prolapse consists in a round, red, elastic tumefaction, between the lips of the vagina, which is easily pushed back and appears mainly when the animal is in a lying posture. This condition often becomes habitual or chronic, which may even last years. A complete prolapsus of the

vagina consists in a very large tumefaction between the lips of the vulva. In this condition the meatus urinarius and the os uteri, are on the surface of the tumefaction. The visible mucous membrane is swollen, thickened, dark in color, covered with excoriations, mucous and in some cases a bloody exudate. Later on this may become gangrenous. There is continual straining as if to micturate. This condition nearly always renders the animal barren, and from a forensic standpoint may be looked upon as an unsoundness.

**Treatment**—The treatment consists in carefully cleansing and replacing. After replacing, have the animal wear a truss. If this is impractical, a few stitches may be taken into the vulva and the animal given some antispasmodic internally. If the animal is in a lying posture, see that the hind parts are well elevated.

#### **New Formations in the Vagina.**

There may be such new formations as polyps, fibromas, fibrolipomas, a hyperplasia of the connective tissue and the mucous membrane. In cows there are sometimes seen cysts filled with a clear fluid resembling a vesicle, which fluctuates and is usually on the left wall. There may be formed blood cysts, which are usually encapsulated hematomas as the result of an injury.

#### **Hermaphrodism.**

Sometimes it will happen that mares will have a penis instead of a clitoris. This condition is known as pseudo hermaphrodism masculinus. This condition is usually relieved by removal of the penis.

#### **OCCCLUSION OF THE VAGINA.**

Occlusion of the vagina, as the result of coition, is quite common. During copulation wounds are produced, producing



inflammation with the vagina assuming a funnel shape. This leads to the retaining of fluids in the uterus with general symptoms and enlargement of the uterus.

**Treatment**—The treatment consists in opening the vagina and os with the hand, followed by antiseptic irrigation.

### INJURIES TO THE UTERUS.

Injuries to the uterus are usually received during parturition by means of instruments, extremities of the foetus, etc., prolapse of the uterus, torsion or spontaneous rupture, and in rare cases external injuries. These wounds may affect the musculature, serous membrane or mucous membrane. These may be superficial or penetrating. A spontaneous rupture of the uterus and penetrating wounds are usually fatal. Superficial wounds are frequently accompanied by severe hemorrhage. Wounding of the cervix very rarely leads to complications. The treatment of wounds of the uterus consists in antiseptic irrigation, astringents, packing the uterus with ice or giving hydrastis internally.

#### Metritis.

According to the cause, character and part affected metritis may be divided into the following forms: Septic, puerperal, traumatic, catarrhal, hemorrhagic, suppurative, croupous and phlegmonous. In regard to the cause it may be divided into acute and chronic.

From a practical standpoint the part of the uterus affected is of the most importance. If the mucous membrane is affected it is known as endometritis; if the musculature is affected it is called metritis and if the peritoneum is affected it is known as perimetritis. If it is a phlegmonous inflammation of the parametrium it is known as parametritis. In puerperal septicæmia and pyæmia all of the uterus is affected. From a

clinical standpoint there are the following forms: Endometritis, septic metritis and parametritis (phlegmon).

### Catarrhal Endo Metritis.

This is a superficial catarrhal inflammation of the mucous membrane of the uterus. It appears in practice in two forms, acute and chronic. It consists in a hyperaemia and swelling of the mucous membrane with the secretion of a muco-purulent exudate.

**Cause**—The most common causes of this disease are retention of the placenta and difficult parturition, with injury and infection. This disease usually appears within from four to six days after parturition, but may not put in appearance until a later date. In cows it is often caused by prolapse of the uterus, vesicular exanthema and by tubercular lesions.

**Symptoms**—The symptoms of catarrhal endometritis consists in a greyish or yellowish foul smelling discharge from the vulva. This discharge may contain albuminous admixtures and be of a muco-purulent nature.

In severe cases there may be such general symptoms as a slight rise in temperature, anorexia, lessening of the milk secretions, straining as if to urinate and sometimes painful urination, straddling gait and stiffness. After a few days there may be swelling of the vulva and vagina. After the acute symptoms have lasted from two to three weeks it passes over into the chronic form (leucorrhœa). In the chronic form there are no general symptoms. The most prominent symptom is a catarrhal vaginal discharge. This is muco-purulent in some cases. In case this exudate cannot be expelled from the uterus and a large quantity collects in the uterus it is known as hydrometra or pyometra. A simple chronic catarrhal endometritis very rarely gives rise to general symptoms but cases of hydrometra frequently lead to pyæmia.

**Prognosis**—The prognosis is favorable if treated properly.

**Treatment**—The treatment of acute endometritis consists in frequent irrigations of astringent antiseptics, as alum, tannin, boric acid, sodium bicarbonate, potassium permanganate, creolin, lysol, etc. In some cases it is necessary to give artificial stimulation. Chronic catarrhal endometritis is almost incurable, but should also be treated with astringent antiseptic irrigations. Internally large quantities of arsenic and general tonics should be given.

### Septic Metritis.

This condition is also known as puerperal fever, puerperal metritis, puerperal septicaemia. This condition is an inflammation of the mucous membrane and the musculature of the uterus, brought on by the entrance of the infection into the uterus, which may result in general pyaemia. The starting point of the disease is abrasion or laceration to the uterus during parturition. The infection is carried into the uterus by the hands and instruments or from a decomposing foetus or afterbirth.

**Symptoms**—The symptoms of septic metritis usually come on in from three to five days after parturition. The first symptoms are straining and uneasiness. The temperature is about 104 degrees F. symptoms of laminitis, fetid chocolate colored discharge from the vulva, the pulse is rapid and weak and the animals seem to have pain and are very uneasy. There is continual straining as if to micturate and the affected animals are very tender to the touch over the abdomen.

**Prognosis**—The prognosis should be guarded.

**Treatment**—The treatment consists in constant antiseptic irrigation of one per cent creolin, lysol, alum, tannin, potassium permanganate. Internally give artificial stimulation as alcohol,

aromatic spirits of ammonia, tincture of camphor, ammonium carbonate, etc.; also echinacea, potassium iodide or nuclein.

### **Prolapsus Uteri.**

This condition occurs most frequently in cows after parturition or as the result of a retained afterbirth. A prolapse of the uterus consists first in inversion followed by prolapsing through the vulva.

**Cause**—The causes are usually continued following parturition, pulling on the afterbirth and nervousness. Such conditions as phlegmatic temperament, partial paresis of the uterus and poor nutrition may be looked upon as predisposing causes.

**Symptoms**—This condition is characterized by a large tumefaction passing out of the vulva. When the animal is in a standing position it may reach the hocks. This tumefaction is covered with small, roseate bodies (cotyledons). After the uterus has been prolapsed for several hours the mucous membrane becomes dark, swollen, friable, and in some cases gangrenous. The entire tumefaction becomes very large and swollen; if the animal is down, it may be torn and on its surface there may be decubital ulcers. If this condition is not properly treated it may lead to septicaemia or pyaemia.

An inversion of the uterus without prolapse is very rarely seen. This is brought on by constant straining. On examining the parts the body of the uterus will be found in the os uteri in the form of a round tumefaction.

**Prognosis**—The prognosis is favorable.

**Treatment**—The treatment consists in carefully cleansing the prolapsed uterus with reposition. After reposition some measures must be resorted to to keep the uterus in position. This may be accomplished by allowing the animal to wear a truss, giving chloral or some hypnotic internally. Before



attempting a reposition, carefully cleanse the uterus with cold water containing alum or creolin. Cold water is indicated, for it causes contraction of the uterus and keeps the cow from straining. Warm water is contra indicated, as it causes the animal to strain and reposition is almost impossible. In replacing the uterus it is most convenient to have the animal in a standing position. The uterus should be placed on a towel covered with powdered sugar and held by an attendant. Then an attempt should be made to pass the hand through the prolapsed uterus into the vagina. In this way it will usually become adherent to the arm, and as the arm is pushed forward the uterus will follow. After reposition is accomplished the uterus should be packed with ice or filled with very cold water. It may be necessary to apply a truss or take one or two stitches in the lips of the vulva. Some authorities state that tracheotomy is of considerable service in these cases.

In those cases where the prolapsed uterus cannot be replaced, amputation may be resorted to. This is done as follows: First ascertain that there are no intestines or mesentery in the prolapsed portion of the uterus. Thoroughly cleanse everything and apply an elastic ligature around the uterus as closely to the vulva as possible. Then with a knife remove the uterus within about one inch from the ligature. After removal push the stump back into the vagina and irrigate once daily with some astringent antiseptic.

### Torsio Uteri.

This condition is seen most frequently in cows but may occur in mares and bitches. Torsio uteri consists of a twisting of the uterus on its long axis and comes on during pregnancy just before parturition.

**Cause**—The cause is supposed to be undue activity of the foetus, shipping, overloading of the digestive apparatus, running, being cast in the stall or over-exertion of some kind.

**Symptoms**—The symptoms of torsion or a twisting of the uterus are a turning on its long axis of one-quarter, one-half, three-quarters, one full turn or being turned twice. This twisting may be to the right or left. At the time of parturition there is a great straining and the appearance of the water sack. On rupturing this sack there is usually no water present. By manual exploration a twisting of the vagina with spiral folds in its side walls may be felt. The vagina is narrow and contracted. If there is complete torsion it is impossible to pass the hand into the uterus. The way in which the torsion turns may be determined by the direction of the folds on the vagina. If this condition is not relieved the animal dies from septic metritis, internal hemorrhage or strangulation. It may be possible for an animal to live one or two weeks in this condition, but it is rarely the case.

**Prognosis**—The prognosis is doubtful and should be guarded.

**Treatment**—The treatment consists in casting the animal, pass the hand into the uterus and grasp the foetus. Hold the foetus and roll the animal until the uterus is in its normal position.

#### Retention of the Placenta.

Retention of the placenta is usually due to some faulty condition of the uterus. This is seen mostly in cows and mares.

**Cause**—This is usually due to a pathological condition of the uterus itself or the animal may be poorly nourished or a lack of postpartum contractions. It may follow in cases of abortion, accidental and infectious endometritis, fatty infiltration in very fat animals, or it has been known to follow where the animal gave birth to twins. The placenta may become adherent to the walls of the uterus as a result of placentitis. If the cervix closes too rapidly the placenta may be retained

as the result of this. Normally the placenta is passed in a mare in about one-half hour after parturition, and in a cow from one to six hours.

**Symptoms**—The symptoms of retained placenta are as follows: There is usually a small part hanging from the vulva. After three or five days decomposition sets in and there is a brownish, foul smelling discharge from the vulva with frequent straining. As a rule the general condition is not greatly affected as the result of this decomposition. In severe cases there may be slight general symptoms. This condition usually leads to catarrhal endometritis, with a stinking, discolored discharge, general emaciation, gastric disturbances and lessening in the milk secretion. It may occur that this condition may lead to septic metritis, puerperal septicaemia or tetanus. In some cases the placenta is retained, decomposition does not set in and resorption occurs. This usually gives rise to general emaciation and slight gastric disturbances.

**Prognosis**—The prognosis should be guarded especially if the placenta is decomposed.

**Treatment**—The treatment of this condition consists in manual removal of the placenta. This must be performed most thoroughly and the placenta removed in toto. If there is a small piece remaining it may give rise to severe general symptoms. After removing the placenta, the uterus should be irrigated at least six times with one per cent solution of creolin or permanganate of potash. Such medicinal agents as hydrastis, ergot or eserine should be given to cause a contraction of the uterus.

Tuberculosis of the uterus often occurs in the form of metritis. The mucous membrane is covered with ulcerations, nodules, and abscesses form in the walls of the uterus. These give rise to a discharge. The mode of infection may be by means of coition. The only visible symptoms are those of a

muco-purulent vulval discharge. It may give rise to abortion, sterility, nymphomania, dilatation of the cervix, chronic thickening of the walls of the uterus.

## DISEASES OF THE MAMMARY GLAND.

### Mastitis.

The most common forms of mastitis are due to an infection. The infection is transmitted through the teat canal, the lymph stream and the blood stream. A great many cases of mastitis are due to specific infections as tuberculosis, actinomycosis, and botryomycosis. The common bacteria causing mastitis are streptococci, staphylococci and micrococci. The predisposing causes are traumatism, so-called catching cold, oedema of the udder and improper milking.

The ancients taught that mastitis was due to catching cold and rough handling of the udder or improper milking. Recently we have come to believe that it is due to an infection. The infection gains entrance through the teat canal, passes up the canal and from there infects the entire udder. This causes the decomposition of milk, this in turn irritates the mucous membrane and the epithelium.

There are three ways in which mastitis may be spread. First by means of the teat and milk duct (galactogenous mastitis), secondly by the lymph stream through lesions in the skin and subcutaneous tissue (lymphogenous mastitis), and thirdly by the blood stream (hemotogenous mastitis).

### Oedema and Phlegmon of the Udder.

Toward the end of gestation there is a congestion of the udder and as a result a great quantity of serum is thrown out into the subcutis. After calving, the udder becomes very painful and swollen so that milking is almost impossible. The



udder is very hot and the skin is reddened. A wound infection may cause the same condition.

**Prognosis**—The prognosis is favorable in most cases.

**Treatment**—Massage with frequent milking, bathe the udder once an hour with warm water, apply warm lard and turpentine with plenty of massage, or camphorated oil and plenty of massage, or belladonna ointment freely with massage. *Nux vomica* and *phytolacco* should be given internally.

### Abscess of the Udder.

This affects only one-quarter of the udder. A hind quarter is more frequently affected than a fore quarter.

**Cause**—This condition is usually due to wounds with direct infection.

**Symptoms**—The symptoms are fever and a severe phlegmon with abscess formation, the abscess involves the parenchymatous and subcutaneous connective tissue. These abscesses point very slowly. In rare cases the abscess will discharge into the teat canal. The discharge from the abscess is very thick and bloody.

**Prognosis**—The prognosis is usually favorable. The course is about three to four weeks.

**Treatment**—The treatment consists in trying to cause the abscess to point by using antiphlogistine, Priesnitz packs, moist heat, liniments, etc. Open abscess and evacuate its contents as early as possible. Treat symptoms as they arise.

### Catarrhal Mastitis.

This consists of an inflammation of the mucous membrane of the sinuses and canal. This inflammation spreads to the epithelium, causing a change in the secretion.

**Cause**—The cause is bacteria gaining entrance into the canal.

**Symptoms**—The udder feels hard and nodular. The swelling is low down and affects only one quarter or a half of the udder. The gland tissue is not affected in the beginning of the disease. The milk that is drawn off is watery, flocculent and in some cases cheesy. This disease usually leads to stenosis or obliteration of the teat canal, causing the animal to lose that quarter. The disease may also lead to pseudo-hypertrophy, causing so-called fleshy quarter.

**Prognosis**—Prognosis is unfavorable so far as the affected part of the udder is concerned.

**Treatment**—The treatment consists in hot water and plenty of massage, camphorated oil with plenty of massage, liniments, phytolacca and nox vomica internally.

### Parenchymatous Mastitis.

This particular form of mastitis is the most common. This involves the mucous membrane of the teat cistern and the epithelium of the gland. This disease may affect the entire udder or only one quarter. As a general rule only one quarter is affected. Hind quarters become affected more often than fore quarters.

**Cause**—The cause is wounding of the udder. It is seen secondarily to foot and mouth disease and infectious aptha.

**Symptoms**—The symptoms appear after a period of incubation of from two to three days. The udder is hard and tense, the skin is swollen and reddened, the animal shows great pain on pressure, the milk is very cheesy in consistency. Almost complete anorexia. The temperature is elevated and the animal may have a chill.

**Course**—The course is short. The portion of the udder affected usually becomes atrophic.

**Prognosis**—The prognosis so far as life is concerned is favorable, but the function of that quarter is lost.

**Treatment**—The treatment consists in frequent milking with massage, use teat tube, treat the same as above. Preventive treatment consists in careful handling of the udder and proper milking.

### **Septic Mastitis.**

**Cause**—The cause of this form of mastitis is supposed to be due to metastasis. That is the pus cocci are carried by the blood and then lodged in the udder. It usually follows septic metritis or septic gastro-enteritis. This disease is not very common but does occur occasionally.

**Symptoms**—The symptoms are a high fever, 103 to 105 degrees, the pulse is 90 to 100 per minute, the respirations are 25 to 40 per minute, the udder is severely swollen, on milking there comes a dark, bloody, stinking discharge. In some cases almost pure pus comes out.

**Prognosis**—After three or four days the animal usually becomes cyanotic, collapses and dies.

**Treatment**—There is no good treatment for this disease.

### **Gangrenous Dermatitis of the Udder.**

By means of wound infection the skin and entire udder may become gangrenous.

**Symptoms**—One or two days after the infection the milk appears dark and bluish, affected portion of the udder swells

and becomes reddened and generally only one quarter is affected.

**Course**—The course is two to three days.

**Prognosis**—The prognosis is favorable.

**Treatment**—The treatment consists in antiseptic ointments.

### **Infectious Gangrenous Mastitis.**

This disease is contagious and usually there is more than one animal affected. The disease appears sporadic and enzootic.

**Symptoms**—One quarter of the udder becomes bluish in color and cold; from the teat there exudes a dark stinking fluid. No general symptoms appear except in the first stages of severe cases. Later on the affected quarters drop on.

**Treatment**—The treatment consists in surgical removal of the parts affected.

### **Stenosis and Obliteration of the Teat Canals.**

Stenosis and obliteration of the teat canals occur quite commonly among cows. It is usually due to some traumatism or inflammatory condition. This may be in the form of a new formation or it may be congenial. Those stenosis that occur as the result of traumatic or inflammatory causes are usually cicatrices which form strictures as the result of contracture. The teat may receive an injury from the outside which would tear the mucous membrane and give rise to a circumscribed traumatic inflammation, with the subsequent



formation or nodular or circular cicatrices which cause a narrowing of the canal.

There are various new formations which are formed in the lumen, the most common being papillomas. These are usually upon the mucous membrane of the canal, but may form in the cisterns. It very rarely occurs that fibromas form in this region.

There may be a congenital atresia in which there is no opening in the teat, no teat canal and in some cases no cistern.

**Symptoms**—The symptoms of stenosis of the teat canal begin by hard milking. The milk is forced out in very thin streams and considerable force must be used. In rolling the teat between the fingers it is tense and thick. By passing a teat tube or probe the exact condition can easily be felt. In chronic cases there is no pain, but in acute cases there is more or less pain.

**Prognosis**—The prognosis is usually unfavorable in high stenosis as the treatment of these usually results in mastitis, while in a cow stenosis the prognosis is favorable.

**Treatment**—The treatment consists in widening or enlarging the canal with bougies and tubes, or with a specially constructed instrument known as the "teat slitter."

### **Milk Fistula.**

By the term milk fistula is designated an abnormal skin opening which discharges milk in the region of the mammary gland. This may be along the side of the teat or milk cistern and in very rare cases these openings may open directly into the gland itself. A fistula is distinguished from a fresh wound by the fact that it is almost painless and only slightly swollen.

**Cause**—The causes of milk fistula formation are traumatisms, abscesses, furunculosis, and in rare cases it may be congenital. Acquired fistula are usually brought on during the period of lactation. These fistulæ are usually the result of faulty cicatrization because during the process of cicatrization milk continually flows through the wound and as a result a fistula is formed.

**Symptoms**—A milk fistula may appear on any part of the teat or udder. It manifests itself by a small, smooth, round opening with very thick walls. From this opening milk flows either constantly or during the act of milking. There are no symptoms of inflammation, reddening, swelling or temperature present.

**Prognosis**—A fistula of the gland is more easily treated than a fistula of the teats. These fistulæ will heal spontaneously during the dry period.

**Treatment**—The treatment consists in caustics or the actual cautery. After cauterization the opening should be closed by stitching. The edges of the fistulous opening may be curretted and stitched, after which it should be dressed with ariol paste. If the cow is valueless the teat may be amputated above the fistula.

### New Formation in the Udder.

New formations in the udder are seen most frequently in bitches. Adenomas, fibroadenomas and carcinomas are the most common; chondromas and osteomas also appear quite commonly. Sarcomas and lipomas are seen very rarely.

**Treatment**—The treatment of these consists in amputation of the gland.

There are specific new formations in the udder which are seen most commonly. These are due to a specific infection

which gives rise to a chronic productive inflammation. These are botryomycosis, tuberculosis, and actinomycosis. These give rise to large painless swellings which have a tendency to break down and discharge. In tubercular lesions the supra-mammary lymph gland is always affected. The diagnosis of the exact nature of these swellings depends a great deal upon the discharge. Tubercular lesions do not have a tendency to discharge, while actinomycosis and botryomycosis do have a tendency to discharge. These lesions may lead to abscess formation with subsequent fistula formation.

## CHAPTER V

### DISEASES OF THE VERTEBRÆ, TAIL AND PELVIS

#### Crural Paralysis.

**B**Y the term crural paralysis is meant a peculiar unsteadiness and weakness of the hind parts, which may be a partial or a complete paralysis. It is also known as paresis, paralysis, paraplegia or palsy. This condition is seen frequently in the horse, the dog and the ox. The pathological lesion has its seat in the cord, peripheral nerves, bone (vertebræ, pelvis or sacrum), muscles of the croup or in the vessels.

Diseases of the spinal cord which may give rise to crural paralysis are pachymeningitis, myelitis spiralis, new formations, tumefactions, and parasites.

**Cause**—The cause of these diseases is usually contusion, freezing, stroke of lightning, various traumatisms, spread of an inflammation from a neighboring part, following infectious and contagious diseases (glanders, dog distemper), and various poisonings as mercury, etc. Also severe hemorrhage and parasites. Diseases of the peripheral nerve endings that may give rise to this condition are polyneuritis, injuries and contusions.

Diseases of the musculature giving rise to this condition are traumatic, rheumatic, toxic, or infectious myositis, acute and chronic inflammatory conditions in this region. Crural paralysis is seen following haemoglobinaemia, lumbago, parenchymatous myositis and acute degeneration of the muscles, rupture or injury to a given muscle.



Disease of the bones and joints causing this condition are fissures and fractures of the vertebræ and pelvis, tuberculosis lesions in the bones mentioned, distortion and luxation of the vertebræ.

Diseases of the vessels giving rise to crural paralysis are phlebitis and thrombosis in the vessels of this region or the lodging of an embolus.

**Symptoms**—The symptoms of complete crural paralysis are a complete loss of motion of the hind parts. This paralysis is of both the motor and sensory nerves, in which the sensodium is in a normal condition. The animal seems to have free use of the fore parts and will sit up or drag the hind parts around. There is also an almost complete paralysis of the bladder, rectum, penis, and tail. The animal does not respond to a pin prick in complete paralysis.

In incomplete or partial paralysis there is a straddling, weaving gait. In advancing the legs they are elevated very high and somewhat resemble stringhalt. The sensibility is lessened but not entirely absent. The paralysis of the bladder, rectum and tail is very mild. In some cases urine drops from the bladder continually.

**Prognosis**—The prognosis of incomplete crural paralysis is usually favorable, most cases recovering in less than two weeks. The prognosis of complete paralysis is less favorable when bilateral and usually quite favorable when unilateral. Unilateral cases usually recover in a week or ten days, while bilateral cases recover in a month. A great many cases of bilateral crural paralysis are incurable leaving the animal in a worthless condition so that it must be destroyed. The prognosis should depend upon the cause. In cases of fracture of the vertebræ it is most unfavorable.

**Treatment**—The treatment of crural paralysis consists in irritating applications externally as massage, blisters, elec-

tricity. Internally strychnin, rhus toxicodendron, veratrin, arecolin, and pilocarpin can be given. In cases of fat and phlegmatic horses phlebotomy should be resorted to and great care should be exercised in the feeding. Feed very little food, and that should be of a soft laxative nature.

### **Ante Partum Paresis.**

This disease is usually seen in cows and appears at or before the time of parturition. This disease usually appears about ten days before parturition. It is very similar to crural paralysis.

**Cause**—At the present time the exact cause is unknown but is supposed to be due to nervous disease. This disease must not be confused with contusion, distortion, luxation and fracture.

**Symptoms**—The symptoms consist in a paralysis which renders the animal unable to get up, otherwise everything seems to be normal, rumination and digestion are normal and the sensorium is clear.

**Prognosis**—The prognosis of this is favorable as it usually disappears after parturition.

**Treatment**—The treatment consists in removing the foetus as soon as possible. Internally give nux vomica, rhus tox or strychnin, and externally use irritating applications.

### **Post Partum Paresis.**

This is practically the same condition as ante partum paresis. The causes are unknown and it always comes on immediately after parturition.

**Prognosis**—The prognosis is generally favorable.

**Treatment**—The treatment is the same as for ante partum paresis.

#### **Fracture of a Dorsal or Lumbar Vertebrae.**

This condition is of practical importance in practice. The causes are mainly external or spontaneous fractures. Traumatisms and injuries are mainly inflicted in an accidental way and are various. The spontaneous fractures are due to excessive muscular contraction with bowing and arching of the back. The vertebrae in the region of the attachment of the diaphragm seem to be fractured most commonly. The reason of this is that it is nearest the center of the arch and is the weakest point. Some diseases predispose to idiopathic fracture as rachitis, osteomalacia, atrophy of the bones, osteoporosis, tuberculosis, ankylosis of the vertebrae. The fractures are usually communicated and crushed involving the body of the bone as well as the transverse process. These fractures are very rarely fissured.

**Symptoms**—The symptoms of a fracture of a vertebrae depend upon the amount of fracture. A complete fracture is characterized by a suddenly appearing paralysis of the hind parts. This paralysis is of both the motor and sensory nerves. The motor paralysis is made apparent by the fact that the animal weaves and falls helpless to the ground. At the same time the bladder, tail and rectum become paralyzed. The skin does not react to a pin prick behind the fracture. The animal may show cold sweat in the region behind the fracture. Abnormal movement and crepitation are absent in the horse but may be noticed in the smaller animals. Fissures are very hard to recognize and diagnose. The animals are uncertain in gait and show more or less weaving of the hind parts. In most cases the animals are worked regularly and in shorter or longer period of time the fissure becomes a fracture. A frac-

ture of one of the processes is manifested by local symptoms, as swelling, heat, pain and crepitation.

**Prognosis**—The prognosis of fractured vertebræ is always unfavorable and the animal should be destroyed at once. If the animals are not destroyed they will die from septicaemia and decubital gangrene.

### Fracture of the Pelvis.

About thirty per cent of all fractures horses receive are fractures of the pelvis.

**Cause**—The causes are usually falling, accidental injuries of various kinds, contusions, difficult parturition. Fractures due to muscular contraction are very rare and usually occur as the result of some diseased condition of the bone as osteomalacia and osteomyelitis. The most common fractures are fractures of the external angle of the ilium, tuber ischia, pubic symphysis, acetabulum, and occasionally the internal angle of the ilium. As a general rule there is more than one fracture present. These fractures may be compound involving the skin and peritoneum. Fissures of the pelvis may also appear but are very hard to diagnose.

**Symptoms**—The first noticeable symptom is a suddenly appearing lameness. This lameness is both supporting and swinging leg lameness. There is also uncertainty in the gait, weaving, abnormal movement, and peculiar abducting and adducting movements. The visible deformity of the pelvis is also a very valuable diagnostic symptom. There is usually a sinking in of one-half of the pelvis, or the whole pelvis is changed in position, or one of the angles may be dropped. There may be a very severe swelling in the region of the rectum, or in the portion affected. In some cases there may be no apparent external symptoms.



Crepitation may be felt by moving the pelvis back and forth. Also this may be heard by placing the ear over the part and then moving the pelvis. Abnormal movement of the pelvis usually occurs when there is a fracture of one of the angles, causing the pelvis to drop and allow abnormal movement. Rectal examination in pelvis fractures is most important in cases of fracture of the pubis, ischium and acetabulum. By rectal examination the fracture may be located; there will be a swelling, hemorrhage, abnormal movement and crepitation. Vaginal examination reveals the same thing.

An animal suffering from pelvic fracture will show great pain, uneasiness and general symptoms, as fever, and anaemia of the visible mucous membranes, if an artery is involved. Symptoms of fractures of the individual bones of the pelvis may be diagnosed only by close inspection and examination.

**Prognosis**—The prognosis of most pelvic fractures is favorable. A callus may form, which would render the animal useless for breeding purposes after difficult parturition. Fractures of the angles of the pelvis usually heal in from one month to six weeks. Compound fractures of the pelvis are usually considered incurable and the animal should be destroyed promptly.

**Treatment**—The treatment consists in sling, rest, good feeding, and hygienic surroundings. The animal should be given syrup of lime, or phosphate of lime on the feed.

### Fracture of the Sacrum.

The cause of fracture of the sacrum appears mostly in small animals and in large animals as the result of difficult parturition. It may also appear in young heifers as the result of accidental injuries.

**Symptoms**—The symptoms usually result in a paraplegia the same as in fracture of the vertebræ. The main symptoms are a paralysis of the tail, rectum, penis, and bladder.

**Treatment**—The treatment consists in symptomatic treatment. Unless the fracture is only partial, then recovery may take place by treatment with stimulants. A complete fracture is incurable and the animal should be promptly destroyed.

### Luxation of the Sacrum.

This condition is seen mostly in cows and occurs as the result of difficult parturition. It may also appear in the mare but is very rare, or in animals that are very far advanced in pregnancy and suffer from some accidental injury causing this condition.

**Symptoms**—The symptoms of this condition are divided into partial and complete. A complete luxation of the sacrum gives rise to symptoms of paraplegia, the sacrum is sunken and there is crepitation and grating over the part affected, the internal angle of the ilium appears to be raised. By rectal examination the sacrum is sunken into the pelvis, and the cavity appears to be very much smaller as the result of this.

In partial luxation, which is by far the most common, there is an unsteady and weaving gait, stiffness, grating and crepitation at every step, and severe pain and crepitation on palpation over the affected part.

**Prognosis**—The prognosis of a partial luxation is favorable, recovery taking place in from three to four weeks. In complete luxation the prognosis is less favorable and in some cases bad. These animals suffer from decubital gangrene and die from sepsis.

**Treatment**—The treatment consists in rest, irritating applications over this region of the body and stimulation internally.

## LUMBAGO.

### Myositis of the Croup-Muscles:

In horses and dogs myositis does not appear as a rare disease. This disease usually runs under the picture of crural paralysis.

**Cause**—The cause of this condition may be rheumatic hemoglobinaemia as a result of so-called catching cold, rheumatic myositis. Also brought on by the so-called catching cold, as the result of casting, especially in phlegmatic horses, and a traumatic myositis which is brought on by injuries, as contusions, bruises, falling on the street, etc.

**Symptoms**—The symptoms of hemoglobinaemia usually appear after a severe chilling shortly after leaving the stable. The animals will appear lame and stiff behind, they may weave and are very sluggish. They will not move until forced to, the croup muscles are stiff and hard, the urine is usually dark in color. As a rule in this disease one side of the croup is affected more than the other.

**Prognosis**—This disease ends very rapidly in death or recovery, two days being the longest time consumed in either case. A chronic myositis may be left over as the result of this condition, or a chronic crural paralysis with a partial paralysis of the penis.

**Symptoms**—The symptoms of rheumatic lumbago are stiffness of the croup, arching the back, great pain when the animal moves or gets up. On manipulating this part of the body the animal shows great pain. This condition appears very commonly as the result of over-exertion and severe labor along with taking cold.

The symptoms of lumbago which arise as the result of the animal being cast, are a painful swelling of the muscles, which

causes the muscles to be stiff and the entire body to be carried stiffly. In three or four days there appears a degenerative atrophy of the involved muscles resulting in a severe atrophy, which takes the animal months to recover from. A very severe case of this kind closely resembles azoturia and may be fatal.

**Treatment**—The treatment consists in slinging the animal, rest, massaging the affected parts, blistering the affected parts or some irritating application. Hypodermically eserine, arecoline, pilocarpine or caffein should be given. If the animal is fat and phlegmatic, phlebotomy should be resorted to. Internally salicylic acid, salicylate of soda or antifebrin should be given as anti-rheumatic agents. In case the animal becomes very restless some narcotic may be given.

### Thrombosis of the Iliac and Femoral Arteries.

**Cause**—The causes of thrombosis are the lodging of an embolus in the bifurcation. These emboli come from the heart or the posterior aorta, as the result of chronic deforming endarteritis or endocarditis necrosa. This form of thrombus is the form that causes the so-called intermittant lameness in horses.

The pathological condition of this disease is as follows: At the point of division of the posterior aorta and the branches, there is a thickening and hardening of the walls of the vessels and the formation of an organized thick thrombus. The lumen of the vessels is narrowed and as a result of this the remainder of the vessels undergo a compensatory hypertrophy.

**Symptoms**—The symptoms of this disease appear only after a period of exercise. During a period of rest no symptoms of this disease are shown. During a period of exercise there is a characteristic lameness of the hind parts, which at first is very slight, but later on becomes very severe and renders the animal useless. After a short period of rest these symptoms



entirely disappear. These symptoms may appear in one or both legs. This lameness is a mixed lameness and is peculiar to this disease. The symptoms usually start with weaving and apparent weakness of these parts. The feet are dragged and it seems impossible to move the legs forward. These animals nearly always go down, along with this lameness, there are general symptoms of distress, dyspnoea is noticed, the pulse runs high, the heart beat may be heard several feet away from the body, the animal shakes and trembles and the body is covered with sweat. No pulsation can be felt on the affected side or sides. By rectal palpation the thickening may be felt and there is no pulsation in the affected artery. Usually a period of fifteen to twenty minutes is necessary for all of these symptoms to abate.

## CHAPTER VI

### DISEASES OF THE HIP

#### The So-called Hip Lameness.

**T**HIS lameness is very characteristic and similar to shoulder lameness. It is a typical swinging leg lameness and is brought on by a very great variety of diseased conditions in this part of the horse. In some cases this lameness may be mixed and appear in a great many forms. Swinging leg lameness is noticed particularly when the animal extends and flexes the leg or in raising or lowering the foot. In very severe lameness of the hip the animals do not bear any weight on the foot.

**Cause**—The causes of this condition may be located in the musculature, bursæ, nerves, vessels and joints. Diseases of this joint consist in distortion, luxation or coxitis. Diseases of the bone causing this condition are fracture, periostitis, and osteomyelitis. Diseases of the musculature causing this condition may be contusion, laceration, rupture, myositis, and partial paralysis.

Diseases of the bursa are mainly inflammation in the form of bursitis, and the diseases of the nerves are mainly paralysis.

#### Coxitis.

This is an inflammation of the coxo-femoral articulation.

**Cause**—The cause of coxitis in animals is usually an acute subluxation of the hip joint with a resulting inflammation. It is usually due to traumatism of an external and accidental nature, missteps, jumping and running, or there may be

the spread of an inflammation from a neighboring tissue. Pyaemia is a very important cause of coxitis in foals.

**Symptoms**—The symptoms of coxitis, especially distortion and acute coxitis, consist in suddenly appearing lameness, which makes itself manifest by movement. By manipulating the leg great pain will be shown. In the region of the coxo-femoral articulation there may be swelling, heat, or pain, or these symptoms may be negative.

Chronic deforming coxitis is accompanied by severe muscle atrophy, and the formation of an exostosis in the region of the joint.

**Prognosis**—The prognosis of acute coxitis is favorable, while that of chronic coxitis is unfavorable. Chronic coxitis usually manifests itself in the form of a chronic incurable lameness. An acute lameness may also terminate unfavorably by rupture of the capsule or capsular ligament, or an injury to the joint surface.

**Treatment**—The treatment consists in rest, moist heat, blistering agents and eventually cautery.

### Luxation of the Femur.

Luxation of the head of the femur very rarely occurs in the horse, but is seen most commonly in the dog or ox. As a rule it is of traumatic origin and due to over-exertion, casting, faulty stepping, etc. It may also be due to various pathological conditions, as an animal suffering from a deforming coxitis is predisposed to luxation of the femur.

**Symptoms**—The symptoms of luxation of the femur usually consist in a luxation toward the upper and outer part of the fossa. The characteristic symptom is a shortening of the affected leg, severe lameness, there is no free movement of the leg as that is hindered by this condition, the hip has a

peculiar aspect and the general condition and position are changed.

**Prognosis**—The prognosis of this condition is usually unfavorable for the capsule is torn, and there is a severe hemorrhage into and around the joint. The prognosis is also rendered unfavorable by the fact that the leg cannot be bandaged, and the result is the formation of a false joint (nearthrosis). This false joint eventually becomes serviceable and after a long period of rest the animal may again be serviceable. However, there is always a slight chronic lameness left behind.

### Fracture of the Femur.

The causes of fracture of the femur are mainly mechanical injuries. This condition is seen most commonly in dogs and less frequently in horses. When this condition does occur in the horse it is usually due to casting, or spontaneous fracture due to some pathological condition of the femur, with an excessive muscular contraction.

**Symptoms**—The symptoms consist in an immediate high grade lameness, abnormal movements in the affected leg, pain, swelling, and crepitation in the region of the fracture and in a great many cases shortening of the leg itself.

**Prognosis**—The prognosis depends upon the part fractured and the extent of the fracture. If it is a fracture of the body the prognosis is unfavorable, if the fracture involves one of the trochanters, the prognosis is most favorable.

**Treatment**—The treatment consists in rest, sling and casting in dogs, if possible.

### Myositis of the Femoral Muscle.

The causes of this condition are contusions, bruises, tearing or rupturing of the femoral muscle. These muscles are very apt to become affected.



**Symptoms**—The symptoms consist in unilateral lameness, which is as a general rule swinging leg lameness. This lameness may become so severe that a fracture of the pelvis is susceptible. Locally there is pain, swelling, heat, and in some cases the formation of a hematoma. If the muscle is ruptured, there will be typical symptoms of a depression and the ends of the muscle may be plainly felt. If this condition is of long standing, there is a severe atrophic condition of the muscles.

The course of this disease is usually acute, as it follows accidents from street cars, falling, being run into, etc.

**Prognosis**—The prognosis of this condition is favorable.

**Treatment**—The treatment consists in moist heat, massage, liniments, and blistering agents. Subcutaneous injections of strychnin and veratrin are also very serviceable. Hematomas should be opened and drained.

### Paralysis of the Quadriceps Femoris.

This condition is commonly called crural paralysis, but is a misnomer. Formerly the cause of this condition was thought to be a nervous disease, but recently we have come to know that only a few cases of this condition are neurogenous, by far the most of the cases are myogenous.

**Cause**—A myogenous quadriceps paralysis is due to a parenchymatous myositis, which is usually the result of azoturia. On section the affected muscle is found degenerated and it has undergone an inflammatory process. It is greyish in color and in most cases has undergone fatty degeneration. These same symptoms may also occur as the result of severe over-exertion of the muscle. However, the majority of these cases have their origin in azoturia.

A neurogenous quadriceps paralysis is usually due to tearing, rupturing, or contusions of the nerve trunk itself. This of course is not very common.

**Symptoms**—The symptoms of quadriceps paralysis consists in a breaking down of the entire leg during motion, that is, it is unable to bear the strain that is thrown on it as the result of motion. This collapse seems to be most marked in the region of the stifle. After this condition has been present for a short time a severe degenerative atrophy takes place, making the condition all the more grave. Eventually the quadriceps entirely atrophies and appears just like a thin aponeurosis. All other symptoms are negative.

**Course**—The course of this condition is usually chronic, lasting for months. In a great many cases it is necessary to destroy the animal on account of this condition being incurable. Healing of this condition is very slow, taking several months. Healing in a short time is relatively uncommon.

**Prognosis**—The prognosis of this condition is as a whole unfavorable, as about seventy per cent of all cases are rendered worthless. The prognosis is more unfavorable in bilateral cases.

**Treatment**—The treatment consists in rest, massage, electricity, blistering agents, firing and subcutaneous injections of strychnin. The most essential thing is gentle exercise given regularly. In order that this may be done it is best to turn the animal out to pasture or it should be given great freedom.

### **Bursitis Trochanterica.**

This condition occurs quite commonly among horses and consists in an inflammatory condition of the tendon and bursa of the gluteus medius.

**Cause**—It is usually the result of contusions as falling, being struck, and in some cases over-exertion may cause it.

**Symptoms**—The main symptoms consist in a painful inflammatory swelling in the region of the trochanter. In case

it is fibrinous bursitis there may be crepitation. The animal shows swinging leg lameness when the leg is rotated toward the inside.

**Course**—The course is usually acute, but may become chronic as a result of exostosis formation in this neighborhood. This results in a chronic lameness with muscle atrophy.

**Treatment**—The treatment consists in rest, massage, moist heat, liniments and eventually blistering and firing.

## DISEASES OF THE STIFLE.

### Acute Gonitis.

Acute gonitis is an acute inflammation of the stifle joint.

**Cause**—In animals it is usually the result of traumatic injuries, contusions, distortions and all manner of wounds. It may also occur as the spread of an inflammatory process, especially suppurative phlegmon, suppurative tendo-vaginitis and also as the result of pyaemia.

According to the cause and anatomical character of the lesion there are two forms, acute serous aseptic and infectious suppurative or gangrenous.

The acute serous gonitis, also known as acute hydrops, usually results from traumatic injuries to the joint capsule.

**Symptoms**—The symptoms are a rapid swelling, which is hot, painful, soft and fluctuating. There is very severe lameness on motion and there are no general symptoms.

The acute suppurative gonitis is characterized by a very severe swelling, which is diffuse, very painful and hot, high grade lameness and general symptoms of septicaemia and pyaemia.

**Prognosis**—The prognosis of suppurative gonitis is unfavorable usually resulting in death. The prognosis of the

acute serous is usually favorable but should be made with care as there is apt to be a chronic lameness left over in the form of a chronic deforming gonitis. Acute serous gonitis may also develop chronic hydrops of the joint.

**Treatment**—The treatment consists in moist heat, massage, blistering and rest in case of acute serous arthritis. Septic arthritis usually runs a very severe acute course and should be opened and treated accordingly.

### Chronic Deforming Gonitis.

**Cause**—The causes of chronic deforming gonitis are over-exertion, hard and severe work, distortions and contusions. It usually results from an acute form. Predisposing causes of this condition are faulty position of the hind leg, weak constitution and extreme youth when put to work.

**Symptoms**—The symptoms of chronic deforming gonitis consist mainly in chronic lameness, which is not noticeable after a long period of rest. If the animal is put to very hard work the lameness becomes more severe. The lameness consists in a tripping or hopping gait. The affected limb is held in a flexed position when the animal is at rest. The lameness becomes more severe if the joint is severely flexed for a few minutes, then the animal moved off. After the disease has been in existence for several months, there is a noticeable swelling in the region of the joint, which is permanent. The entire joint is thickened. On the inside of the joint, well down, there is a swelling which is cold, painless, circumscribed and semi-solid. After this disease has been present for some time, there appears a severe muscular atrophy of the entire hip musculature, especially the quadriceps femoris. There is great pain shown on passive movement of the joint. By laying the hand over the joint during passive movements crepitation can



be readily felt. Animals suffering from this condition very rarely lie down as it is very painful.

Chronic deforming gonitis is a typical inflammatory and degenerative process of the bone, cartilage and joint capsule. In the bone there is a subchondral rarefying osteitis, with later a condensing osteitis. Secondly the cartilage becomes affected beginning on the edge and working to the center. The cartilage becomes bluish red in color and is covered with erosions.

The capsule of the joint has undergone a marked thickening, causing the joint to appear twice the normal size. The synovial membrane is very red and vascular, the surface is rough and covered with erosions. These erosions sometimes appear like polypi. In the joint itself there are floating particles, which appear to be fibrinous or cartilaginous in origin. The synovia is dark brown in color, fibrinous, and thicker in consistency than normal.

The edges of the joint are covered with exostosis of various sizes. These are usually the consistency of cartilage.

**Prognosis**—The prognosis of this condition is not favorable. Unilateral gonitis is more favorable than bilateral gonitis. Bilateral chronic gonitis is usually considered an incurable condition.

**Treatment**—The treatment consists in rest, massage, blistering and firing.

### Luxation of the Patella.

Luxation of the patella occurs in all animals. It appears in the form of traumatic luxation or an abnormal contracture of the quadriceps. Spontaneous luxation of the patella is seen in young emaciated animals and in young animals in which the cartilage of the femur is too flat. This condition is congenital in some animals.

There are various forms and grades of luxation of the patella. There is momentary luxation, habitual luxation, stationary luxation, complete and incomplete luxation. From a practical standpoint there are two very common forms, which are important. These are luxation of the patella upward and luxation of the patella outward.

#### **Luxation of the Patella Upward.**

This form is most common in young animals and may be stationary, momentary or habitual.

**Cause**—Stationary luxation of the patella upward is usually the result of a traumatism or over-exertion. The patella glides past the condyle and remains, causing a peculiar stiffness of the entire leg. The leg may be in a flexed or extended position.

**Symptoms**—If the animal tries to go forward the leg is usually dragged. By palpating the leg the patella can be easily located and the patellar ligaments will be found to be very stiff and contracted. By carefully manipulating the leg the patella will be heard to slip back into place.

After this all symptoms abate and the animal walks in the normal manner. As the result of this displacement there is an acute inflammatory swelling of the joint. A momentary stationary subluxation does not necessarily injure the animal permanently and may never occur again.

A habitual luxation occurs without any apparent cause.

**Symptoms**—It is noticed in walking and turning around. Suddenly the animal cannot walk, is stiff and the affected leg is immovable, or it may appear constantly and at every step there is heard that peculiar snapping sound, which is produced by the slipping of the patella over the condyle. In other cases the animal may assume a gait which is very similar to stringhalt.

**Prognosis**—The prognosis of stationary luxation is favorable, especially in older animals. It may or may not appear again. The prognosis of habitual luxation is less favorable and usually proves to be chronic.

**Treatment**—The treatment of stationary luxation consists in reposition of the patella. This is done by manipulating the patella with the hand, allowing the assistant to flex the leg. After the patella is replaced the animal should have a long period of rest. Over the joint there should be applied a severe blistering agent.

The treatment of habitual luxation consists in a long period of rest, the application of blistering agents over the entire joint or the application of cautery. The animal should be put in slings after the application of the actual cautery. If this is not feasible an operation consisting of severing the middle straight ligament of the patella should be performed.

Luxation of the patella outward is a very rare disease and does not occur commonly. This may be a complete or incomplete luxation also. The symptoms consist in lameness and a short jerky stride in incomplete luxation. However, complete luxation consists in a complete lameness and a complete breaking down at every step. By local palpation the patella can be plainly felt out of place.

The prognosis of this is unfavorable and the treatment is the same as above.

#### **Bursitis Subpatellaris.**

The causes of bursitis subpatellaris are usually of traumatic origin with the resulting formation of a tumor like mass which resembles a shoeboil in form.

**Symptoms**—The symptoms consist in a circumscribed tumefaction under the skin and above the tibia. This tumefaction is about four inches below the joint. In very acute cases

this is hot, painful, and often times fluctuating. If the skin is broken in the accident, there usually results a phlegmon or suppurative bursitis. Older cases usually present a hygroma formation or a fibrous tumor. The acute stages of this disease usually give rise to symptoms of lameness.

**Treatment**—In mild cases the treatment consists in painting with tincture of iodine or camphor with puncture. Suppurative bursitis should be opened freely, drained and irrigated antiseptically. A hygroma should be extirpated.

## DISEASES OF THE LOWER PORTION OF THE HIND LEG.

### Wounds and Phlegmon.

The lower portion of the hind limb seems to be predisposed to traumatic injuries and punctured wounds. As the result of wounds in this region, there is danger of wound infectious diseases. The most common of these is subfascial phlegmon or subcutaneous phlegmon; the next common is suppurative tendo-vaginitis and the least common periostitis.

### Subfascial Phlegmon.

This consists in a diffuse, painful, hot, firm swelling in the region of the wound. This gives rise to lameness, general sepsis and necrosis of the surrounding tissue. This condition may result in tendon rupture, fistula formation or excessive granulation. Very severe cases develop into septic phlegmon which results in septicaemia.

**Treatment**—The treatment consists in free incisions with antiseptic irrigation. Spirits of camphor and tincture of iodine are very valuable in this condition.



### Contusions of the Tibia.

Contusions to the inner surface may involve the skin subcutaneous periosteum or bone. If these wounds become infected they may result in suppurative periostitis or osteitis, ossifying periostitis, necrosis or bone as well as fistula formation.

**Prognosis**—The prognosis in these cases should be made with great care, for there may be a fissure present, which would eventually form a complete fracture.

**Treatment**—The treatment consists in tying the animal so that it cannot lie down, disinfecting the wound and giving it good drainage. In some cases it is necessary to curette the wound thoroughly.

### Fracture of the Tibia.

The causes of fracture of the tibia are mainly of mechanical origin. However, there are some general diseases that may predispose to fracture of the tibia.

Fractures of the tibia may be classified as complete and incomplete. Complete fractures of the tibia are mainly compound and green stick fracture.

**Symptoms**—The symptoms of complete fracture of the tibia are a very suddenly appearing lameness following an accident. This lameness is high grade supporting leg lameness, causing the animal to hop on three legs. There is abnormal movement in the portion of the leg below the fracture, crepitation and a painful swelling at the point of fracture.

Fissures are not so easily diagnosable. Fissures are suspected rather than diagnosed properly. There is local swelling and pain and in a great many cases a distinct pain line.

**Prognosis**—The prognosis of complete and compound fracture of the tibia is unfavorable in grown horses. The bone

will heal but there will be a chronic incurable lameness remaining. The prognosis of fissures is more favorable, and will heal if a complete fracture does not develop as a result of it. A complete healing usually takes place after several months.

**Treatment**—The treatment should be slings, plaster casts, rest and tying the animal so that it cannot move in any direction.

#### Rupture of the Tendon of Achilles.

Rupture of the tendon of Achilles or tearing loose from its origin or insertion occurs in animals quite frequently. It may appear as a result of an abnormal contraction of the gastrocnemius, over-exertion of various kinds, jumping and running.

**Symptoms**—The symptoms consist in a peculiar flexed position of the hock while walking and in the standing position. While walking there is a peculiar unsteadiness and jerking of the joint. The entire leg breaks over at the joint at every step. Locally the rupture may be felt. If it is detached from the os calcis, a piece of the bone may be broken off with it.

**Prognosis**—The prognosis is usually unfavorable as it is almost incurable. If it should heal there is apt to be a chronic lameness left over.

**Treatment**—The treatment should consist in rest and a cast.

### DISEASES OF THE HOCK JOINT.

#### Spavin.

By the term spavin is designated a chronic inflammation of the joint, which is most effective on the lower, inner part of the joint. Primarily a spavin is an osteitis of the lower row of tarsal bones; secondarily this results in a chronic deforming arthritis and peri arthritis with exostosis formation. This

exostosis may appear any place on the external surface of the joint. The causes of spavin may be classed as external and predisposing.

**Cause**—The external or direct causes are mainly mechanical contusions, over-exertions, as straining, sticking fast in the mud and early usage.

The supposition is that more uneven pressure is brought on the inner surface of the joint with the result that this portion is mainly affected.

The predisposing, indirect or inner causes are mainly age and disposition, a poor conformation of the joint (the joint is tied so to speak), faulty position, small weak bones in the joint and faulty shoeing.

**Symptoms**—Spavin lameness appears quite suddenly. It is most severe when the animal is taken from the barn and on exercise. The spavin test causes a very severe spavin lameness which is quite characteristic. In the stall moving toward the well side causes more or less pain. The lameness has a peculiar jerking gait, somewhat similar to stringhalt. The step is short and rapid in which the toe drags on the ground, causing the toe of the shoe to be worn off. In breaking over the animal seems to show the most pain. As a result of this, the hip muscles are not properly used and undergo atrophy. Later on the entire leg becomes atrophic. This atrophic condition is very characteristic of spavin lameness. The hoof becomes short and stumpy in accordance with the gait.

The exostosis is not present in all cases. It has a characteristic position, but is not always present at that point. It may occur at any point over the surface of the joint. The exostosis is about the consistency of cartilage at first, later on it becomes about as hard as bone, painless, flat and circumscribed in form. It is immovable and the skin is movable over it. Other symptoms are negative.

**Diagnosis**—To make a positive diagnosis of spavin, certain factors are necessary. The spavin exostosis, the spavin lameness, which is very characteristic, the spavin test and negative results when examining the rest of the affected quarter. The only one of these symptoms that might vary is the spavin exostosis. The spavin test alone is of no value, for it will give the same results in gonitis and coxitis. The diagnosis may be made positive in doubtful cases by a cocaine injection over the anterior and posterior tibial nerve.

Pathologically in the region of the joint there is an exostosis formation, which may be only visible or quite large, or there may be an ankylosis of the lower part of the joint. This ankylosis very frequently involves the small meta-tarsal bones. On cross section the bone is very red and hyperaemic and soft in consistency. As a result of this softening there is produced a hard firm bony substance, which is known as condensing osteitis. The joint cartilage is rough, soft, opaque, and discolored brownish. There may be small erosions over the entire joint surface.

**Prognosis**—The prognosis of spavin is variable but on the whole quite favorable. A spontaneous healing in spavin lameness is the most common form of resolution.

The prognosis of spavin depends upon the age of the lameness, position and form of the exostosis, the age and the care and usage of the animal. If the spavin is of very long standing, and the entire leg has become atrophic with a congenital joint for spavin, the prognosis is more unfavorable. Also if the leg has a faulty position. The prognosis is more favorable in a perfect joint, new formed spavin lameness, when the exostosis is low and the animal can be well taken care of and given plenty of rest.

**Treatment**—The treatment consists in first of all a long period of rest. If possible the animal should rest at least a



month and as much more as possible. A great many cases heal spontaneously in this manner. Along with rest the animal should be properly shod. A long shoe should be fitted to the foot with long heel calks and no toe. This seems to relieve the pressure and will give very marked relief in spavin lameness. Along with rest and proper shoeing, irritating ointments should be applied or the animal should be fired. This firing should be of the punctured form and should not only cover the exostosis but should extend over and around the exostosis. Tenotomy for spavin lameness does not seem to give the desired results and in late years has been abandoned.

Anterior and posterior tibial neurectomy for spavin lameness should only be resorted to as a last resort.

### **Injuries to the Joint and Surrounding Synovial Membranes.**

Injuries to the joint are mainly mechanical injuries, contusions, etc. In a great many cases open joint is the result. Opening of the joint is usually diagnosed by the flow of synovia, and a severe acute arthritis is usually the result, with death from septicaemia.

**Treatment**—The treatment consists in thorough disinfection with the application of an occlusive bandage.

Inflammation of the hock joint is usually the result of mechanical irritations, distortions, fractures, luxation and subluxation, the spread of a suppurative phlegmon or suppurative tendovaginitis. This condition may be brought on also by pyaemia, septicaemia, glanders, foal lameness and tuberculosis. The infection enters the joint by metastasis.

There are two common forms of arthritis of the hock. Acute, aseptic, serous arthritis, and acute suppurative.

**Symptoms**—Acute serous arthritis does not differ from any acute, serous arthritis or phlegmon, but in the suppurative there are characteristic symptoms as a diffuse, hot, painful

swelling of the entire joint very severe lameness, a suppurative discharge containing synovia and severe general symptoms.

This usually leads to death rapidly by a generalized septicaemia or the animal dies from decubital gangrene and sinking of the os pedis.

**Treatment**—The treatment is the same as for any suppurative arthritis.

#### **Inflammation of the Tendon Sheaths in the Region of the Hock.**

Inflammation of the tendon sheaths in the region of the hock usually manifests certain symptoms as a long narrow swelling, which is firm, hot, and painful, severe lameness and if suppurative, there is a discharge containing pus and synovia as well as general symptoms.

**Prognosis**—The prognosis is favorable if drained and properly treated.

**Treatment**—The treatment consists in moist heat, massage, aspiration, free incision and antiseptic drainage.

#### **Peri Arthritis of the Hock.**

This is somewhat the opposite condition from spavin. It is a diffuse chronic thickening of the entire joint and the tissues surrounding it.

**Cause**—The causes are primary and secondary. Primary causes include fracture, distortion, contusion, over-exertion. Secondary causes include the spread of an inflammation, firing, arthritis, phlegmon, or the inflammation of the tendon sheaths in the region of the hock.

In this condition the entire joint is affected. The entire joint undergoes an ossifying periostitis and exostosis formation. As the result of this it becomes enlarged in all directions. In some cases it is three or four times as large as the normal condition. In severe ossifying exostosis the entire joint undergoes ankylosis. The capsular ligament and lateral ligament

become ossified and the skin becomes greatly thickened. The skin and connective tissue become adherent.

**Symptoms**—Chronic deforming periarthrititis is made manifest by a severe chronic lameness. In the region of the joint there are painful swellings, and these give rise to a severe lameness. This lameness becomes very severe after the spavin test. There is a diffuse swelling of the entire joint which is very firm and hot. The skin is not movable over the joint and is very tense. The motion of the joint is either lessened by the swelling or greatly hindered as the result of ankylosis. Animals suffering from this condition do not lie down, but if they fall down it is almost impossible for them to rise again and usually they must be helped.

**Prognosis**—This condition is incurable, but if treatment is properly administered in the early stages, relief may be obtained to a certain extent.

**Treatment**—The treatment consists in moist heat, or cold applications with plenty of massage. Usually firing and blistering increase the trouble. Various cooling liniments seem to give results, as white lotion, white liniment, solution of ammonium chloride. If the lameness is found to be absolutely incurable neurectomy of the anterior and posterior tibial should be resorted to.

### Galls in the Region of the Joint.

A so-called "bog spavin" consists in either a chronic hydrops of the tarsal joint or a hydrops of the tendon sheath of the flexor pedis. It is usually the result of a serous arthritis and manifests itself in the form of cold, painless, fluctuating areas. One of these appear on the outer and upper aspect of the joint, the other on the inner and lower surface of the joint. There may also be another fluctuating spot on the lower and posterior surface of the joint. If these three swellings are

present the condition is called "thoropin." These swellings are compressible and give rise to no symptoms. They are simply blemishes. From a forensic standpoint this is a very important factor.

**Treatment**—The treatment consists in the application of absorbents or a truss. A truss only gives results in acute cases. The proper mode of treatment consists in free incision and drainage except where it is joint hydrop. Iodine, ether, alcohol, and collodion seem to give good results in these cases applied externally.

A hygroma of the tendon sheath of the perforatus is often known as thoropin. This condition may become exceedingly large in severe cases. It forms a soft fluctuating swelling behind and below the joint and outside and somewhat above the joint.

The treatment for this is the same as for bog spavin.

### Capped Hock.

This is a tumefaction on the point of the hock which is generally the result of an injury. This condition may be brought on by several causes.

**Cause**—A bruising of the skin and subcutaneous tissue may give rise to dermatitis, phlegmon, hematoma or a fibrous tumor. Bruising the subcutaneous bursa over the os calcis may give rise to an acute serous bursitis or bursal hygroma.

A bruising of the tendon sheath of the perforans or the subtendonous bursa of the os calcis may give rise to tendonitis, acute and chronic tendo-vaginitis.

A bruising of the os calcis may give rise to periostitis and exostitis formation.

**Symptoms**—Any of the above conditions may give rise to a common set of symptoms. A new formed capped hock appears as a suddenly appearing fluctuating tumefaction which



is warm and very soft. As the case grows older it becomes more firm, cold and painless. If the swelling is more to one side than the other it indicates tendovaginitis. Some acute cases give rise to lameness, but older cases never give rise to any further trouble than a blemish.

**Prognosis**—The prognosis of bruising of the skin is more favorable than bruising of the bursae. The prognosis of hygroma of the bursae is less favorable, but most cases yield to treatment quite readily.

**Treatment**—In acute cases the treatment consists in moist heat, massage and rest, also the application of various irritating liniments. In older cases it is usually a hygroma and iodine preparations should be used. Painting the entire surface with a thirty-three per cent solution of iodine crystals in alcohol or iodine crystals, alcohol, ether and flexible collodion. The radical treatment consists in casting the animal and removing the entire synovial sack. If it cannot be removed with a knife it may be curretted and a strong tincture of iodine applied to destroy the capsule. Aspiration is contra-indicated for in practice the results have not proven satisfactory.

### Curb.

This is a peculiar swelling which appears on the posterior surface of the hock and metacarpal bone. This is only seen from a side view. It may be caused by a variety of conditions.

An inflammation of the perforans, from a contusion (a so-called bony curb), is the result of a contusion from which there arises an exostosis. A periostitis in this region or a chronic inflammation of the capsular ligament may give rise to this symptom.

A congenital curb consists in a chronic weakness of the joint. It is a malformation and has the appearance of a curb. From a practical point of view there are two forms that need

treatment. First a curb due to tendonitis and secondarily a curb due to periostitis with exostosis formation.

**Cause**—The cause of tendonitis in this region is contusion, over-exertion or straining.

**Symptoms**—The symptoms of this form of curb are acute inflammation and lameness. This swelling is very painful and is either soft or fluctuating. After this becomes older the swelling becomes harder, colder and more painless. The cause of this condition is usually acute with a resorption and healing or a chronic thickening left over. This chronic thickening may give rise to a contracture with the formation of stiltfoot.

**Treatment**—The treatment of the acute form consists in moist heat, irritating and stimulating liniments. After the acute symptoms have subsided blistering and firing may be resorted to. Line and feather firing are preferable. If point firing is used, the points should not be punctured through the skin. A chronic thickening may be removed without firing by the use of iodine ointment thirty-three per cent or tincture of iodine thirty-three per cent, or iodine crystals, collodion, ether and alcohol.

Bone curb is the result of a chronic osteitis, periostitis or periarthrititis in the region of the lower and posterior part of the joint. It is not a commonly appearing condition, but does appear at times as the result of over-exertion and contusion. The swelling which arises as the result of this injury is hard, appears to be chronic and causes very severe lameness.

**Prognosis**—The prognosis is very unfavorable and should be treated the same as spavin.

### Stringhalt.

Stringhalt is a peculiar, involuntary jerking of one or both hind feet while the animal is in motion, during the act of

flexion. The leg is suddenly flexed and jerked up in the air. This condition must not be confused with the so-called "cramp," which is seen by making the animal step over in the stall. The cause of this motor disturbance of locomotion is not known. However, it appears in two forms, symptomatic, and true stringhalt.

**Cause**—Symptomatic stringhalt is the result of some painful affliction of the hind leg and is looked upon as being purely reflex. It is known to accompany spavin and habitual luxation of the patella, and occurs after neurectomy in which there is a painful cicatrix formed during the process of healing, after treads on the coronet, nail puncture and scratches.

Idiopathic stringhalt is probably some form of ataxia, but this has never been proven. Some authors seem to think it is due to neuritis or some other form of chorea.

**Treatment**—The treatment consists in perineal tenotomy. In about sixty-five per cent of all cases this seems to give results. The more the hock is flexed and the greater the jerking, the more readily the disease is curable. The operation should be performed below the hock first and if it reappears or does not respond operate above the hock.

### Inflammation of the Tendon Sheaths of the Fetlock and Foot.

Inflammation of the tendon sheaths in the region of the fetlock and foot present identical symptoms of acute serous bursitis and hygroma.

The treatment is the same.

## DISEASES OF THE HOOF.

### Podo-dermatitis.

According to the cause podo-dermatitis may be classified as aseptic and septic. The aseptic form exists without the

presence of bacteria and is due to injuries and traumatisms, traveling on the hard roads and in some cases burning with a hot shoe while fitting. It may also be brought on by applying a severe blister around the coronary band.

The septic form is due to the entrance of bacteria. These enter most commonly through a wound but may be carried there by the blood stream.

According to the cause it is aseptic and septic, according to the grade superficial and deep, according to the size it may be circumscribed or diffuse. From a practical standpoint the following are the most important: Acute, non-suppurative, chronic hyperplastic, suppurative and necrotic.

Acute non-suppurative podo-dermatitis consists in a serous, sero-fibrinous or sero hemorrhagic inflammation of the pododerm, with the thickening of the pododerm.

### **Suppurative Podo-dermatitis.**

**Cause**—The most common cause of this condition is a wound to the pododerm with an infection. It usually occurs after pricking, treads on the coronet, suppurating corns and seedy toe.

**Symptoms**—A superficial suppurative inflammation of the pododerm is usually circumscribed and is characterized by the formation of a thin serous exudate. The exudate infiltrates the pododerm causing it to become swollen. The most characteristic symptoms are a very painful lameness, the entire foot becoming hot and an increased pulsation in the digital arteries. By percussion with a pair of hoof tongs the animal shows great pain. The coronary band and bulb of the heel become greatly swollen and finally discharge pus. After the discharge of pus, the swelling subsides and healing takes place very rapidly.



**Treatment**—The treatment consists in free incision through the horny wall with disinfection and bandaging. This pus may discharge and the wound heal spontaneously.

A deep suppurative inflammation of the pododerm usually involves more of an area of the pododerm and is also circumscribed. This form is characterized by the formation of a thick creamy pus. This form usually appears in the form of an abscess or suppurative phlegmon in the region of the coronary band or the bulbs of the heels. The pus may also undermine the sole and cause a separation in the wall. This condition leads to a very severe lameness, which does not disappear after the pus has been removed. This form leads to the formation of a fistula and quittor, necrosis of the pododerm, os pedis, perforans tendon, and suppurative arthritis. Eventually this condition may lead to septicaemia and pyaemia.

**Treatment**—The treatment consists in excision and cleansing as well as removal of the necrotic parts. This should be followed by careful disinfection.

### Laminitis.

Laminitis is a diffuse aseptic inflammation of the pododerm which occurs in both front feet most commonly, but may appear in all four feet.

This inflammatory process involves the pododerm of the toe, side wall and sole.

According to the cause there are the following forms of laminitis: Due to traumatic injuries, due to injudicious feeding, and symptomatic.

**Cause**—Traumatic laminitis is caused by severe work, over-exertion, fast work on hard roads, forced marches, driving on rough uneven roads, by standing on a hard surface, by suddenly cooling off or by shoeing. Some animals seem to

have an individual predisposition to laminitis. Lymphatic sluggish horses seem to be especially predisposed.

Laminitis frequently follows indigestion, faulty feeding, over-feeding or some fault with the diet. It occurs especially after the animal has been fed great quantities of grain. The supposition is that it gives rise to an auto-intoxication with laminitis as the result.

Rheumatic laminitis, or so-called air founder, occurs as the result of sudden chilling of the body after a long exhausting drive, or after it has been quite hot.

Symptomatic or metastatic laminitis appears as a secondary disease and accompanies this disease or appears as a symptom in the course of the disease. It follows difficult parturition where inflammation of the uterus exists or it may appear as a symptom during the course of influenza or contagious pleuro-pneumonia.

**Symptoms**—The symptoms are divided into acute and chronic. Acute laminitis manifests itself through a suddenly appearing lameness which usually attacks the forefeet. The feet are placed as far forward as possible and the hind legs are also drawn under the body. This is done so that the body weight may be thrown on the hind feet, thus relieving the front feet. The gait is short and painful, the entire body is stiff and the animal walks as though it were tramping on nails. The foot is not placed flat on the ground but the heels touch first and bear most of the weight. In severe cases it is often impossible to move the animal from the spot it stands on.

By local examination the foot is found to be quite warm, very severe pain is caused by tapping the feet or pressure with a tong. There is very noticeable pulsation in the digital arteries. There may or may not be some general symptoms present. In most cases there is a slight fever, loss of appetite and constipation.

The course of acute laminitis is short, usually lasting from four to ten days with complete recovery. Sinking of the os pedis is very uncommon following acute laminitis, but has been known to occur. Metastatic septicaemia has been known to follow acute laminitis with fatal results but is very uncommon.

Chronic laminitis is usually the result of an acute attack being very severe or not being properly treated. The symptoms of chronic laminitis are mainly changes in the hoof and foot structure. A serous exudate is thrown out between the sensitive and horny laminae in the acute stages. This leads to a separation in very severe cases. After there has been a separation the weight of the body is borne by the perforans tendon. The tendon pulls up and back and as a result the point of the os pedis is pulled down, because the laminae have been separated and can no longer support weight. As a result of the foot being unable to bear the weight of the body and the os pedis turning down, the sole becomes flattened out and apparently sinks. As a result of the sole sinking, the entire structure is lowered and there is marked sinking of the coronary band. The coronary band becomes disturbed and irritated, and rings develop in the walls of the hoof. These rings are not even and smooth, but are larger in front and diverge toward the heels. The coronary band has a marked dip in it on the toe wall and the white line is very broad. The toe of the foot is greatly thickened, and the gait of the animals is peculiar, short and very painful.

**Prognosis**—The prognosis of acute cases is generally good but should be guarded.

**Treatment**—The treatment in acute laminitis should be radical. First phlebotomy should be resorted to, at least one gallon of blood per thousand pounds should be drawn. This should be followed by one-half grain arecoline every hour for three hours. The animal should have the affected feet placed

in cold water or packed in ice, or packed with cold white rock. The animal should not be allowed to eat anything for at least two days, and after this it should be given soft laxative diet, as mashes. Diuretics are also indicated as formin in thirty grain doses, turpentine in drachm doses, or one pint of coffee morning and night. The main treatment consists in laxatives, phlebotomy and cold to the feet.

The animal should be shod with a very wide shoe and bring as much pressure on the bars and frog as possible. In cases of chronic laminitis, shoeing is the only agent that will give relief. Blistering and firing the coronary band may give results that are of doubtful value. Neurectomy should never be performed in these cases.

#### Nail Puncture.

By nail puncture is meant the entrance of a nail or a sharp pointed object through the sole of the foot, into the internal structure of the foot. The nail may puncture the pododerm, fatty frog, perforans tendon and the os pedis.

Punctures to the pododerm result in a circumscribed superficial or deep suppurative pododermatitis.

**Symptoms**—The symptoms are hemorrhage, suppuration, lameness, and a circumscribed painful area, found by palpation. The foot may or may not be warmer than normal. As a rule by proper treatment these cases make a nice recovery, but they may result in tetanus, necrotic pododermatitis, or any specific wound infectious disease.

**Treatment**—The treatment consists in free drainage, thorough disinfection by means of soaking and an occlusive bandage.

Puncture of the fatty frog usually leads to circumscribed or diffuse abscess formation or necrosis.



**Symptoms**—The symptoms consist in a canal from which a bloody or suppurative exudate is discharged. The walls of this canal are covered with granulations which are greyish in color. Phlegmon of the fatty frog from nail puncture consists in swelling, serous infiltration and a greyish discoloration. In cases of necrosis of the fatty frog the area is greenish in color. The clinical symptoms of phlegmon consist in a painful swelling which is hot, the bulbs of the heels are greatly swollen and the animal is very lame.

**Treatment**—The treatment consists in free incision and thorough disinfection of the canal. If the necrosis becomes very severe it may become necessary to remove a part or all of it.

Puncture of the bursa podo-trochlearis and the perforans lead to suppurative bursitis and necrosis of the perforans.

**Symptoms**—The clinical symptoms of suppurative bursitis consist in severe swelling in the region of the heels and coronary band, severe pain on dorsal flexion and volar flexion causes supporting leg lameness. Necrosis of the perforans tendon is characterized by a greenish exudate and small pieces of tendon in the discharge. There is a canal which leads to the tendon and discharges an icteric or suppurative discharge. This is accompanied by a phlegmon of the fatty frog and very high grade lameness by volar flexion. If the case becomes very severe there may be a phlegmon of the entire foot and the structure surrounding it. The most diagnostic symptom is the fact that dorsal flexion causes great pain. In this condition there are severe general symptoms, rapid emaciation, anorexia and sinking of the os pedis in the opposite foot. This condition is frequently complicated with suppurative pod arthritis.

**Treatment**—The treatment consists in resection of the perforans tendon. This operation should be performed as early as possible after the diagnosis has been made. In resec-

tion of the tendon it is usually wise to remove the fatty frog and as much of the tendon as possible. An Esmarchs bandage should be applied in the region of the fetlock to prevent excessive hemorrhage. After as much of the tendon as possible has been removed, it is well to curette the entire area and apply iodoform ether freely. Allow this to remain for a few minutes, then thoroughly curette the entire area. After this apply iodoform ether and apply an occlusive bandage. The wound may be packed with iodoform gauze in preference to iodoform ether. This occlusive bandage may be left in position until there is a rise in body temperature indicating absorption of wound products. If the temperature does not rise the bandage should be changed in ten days. After the third day there is very little danger of absorption on account of the formation of granulation tissue.

Punctures of the os pedis and os suffraginis usually lead to fracture and as a general rule are incurable. Puncture and fracture of the os pedis is somewhat harder to diagnose. A puncture of the os pedis may be either partial or complete, depending on the parts punctured. There is a canal which discharges freely. Frequently after an aseptic puncture there is a chronic lameness left over which lasts for months.

Puncture of the coffin joint usually leads to septicaemia and death. There is developed an acute suppurative arthritis. It is made manifest by a circumscribed swelling around the coronary band and other symptoms of septic arthritis.

### Nail Prick.

Nail prick is a condition in which the nail pierces the pododerm, fatty frog, or the sensitive laminae and sole particularly. A direct pricking takes place by the smith driving a nail directly into the pododerm. An indirect pricking is a bruising of the pododerm by the nail coming too close to it. As a result of direct pricking, suppurative podo-dermatitis or

necrosis of the pododerm may follow. The indirect pricking or pressure is usually aseptic and does not have these after effects.

**Cause**—The causes of pricking are nailing too deeply, nailing and drawing the shoe too tightly, not driving the nail through the white line, rasping and paring the foot too thin, steep walls, etc.

**Symptoms**—The first noticeable symptom is great pain in the region of the foot affected. The animal shows great pain by walking on the affected foot. If the nail is drawn, usually a small amount of blood will ooze from the nail hole. It may also occur that this lameness does not appear at once, but does appear after three or four days. After a few days there are symptoms of suppurative pododermatitis, heat and pain on pressure and tapping, pus and blood are discharged from the nail hole. Abscesses may form around the coronet. In severe cases the pricking is usually associated with a fracture of the os pedis and necrosis of the pododerm. Tetanus may result as a wound infectious disease.

**Treatment**—Make a free incision, drain and irrigate by soaking for hours at a time. Use your antiseptics as formaldehyde or bichloride.

### Corns.

By this term is designated a bruising or contusing of the pododerm, which is seen in the region of the bars of the foot. Commonly they are hemorrhagic, aseptic pododermatitis, but may be a suppurative pododermatitis of the sole.

**Cause**—The causes of corns are bruising and contusing the feet, from paring too closely, faulty showing and faulty position of the foot, using hind shoes on front feet, cutting away of the bars and narrow heels predispose to this condition.

**Symptoms**—The symptoms are seen most commonly on the inside of the foot. There is lameness present and upon examination of the foot there is a hyperaemia and hemorrhagic pododermatitis. As a result of this there are red and bluish red spots seen in the sole of the hoof at that point. These are known as dry corns. If the contusion is very severe, pus forming bacteria enter the pododerm and give rise to the formation of pus. This leads to subcoronary phlegmon, abscess formation around the coronet and eventually may lead to a quittor formation.

**Treatment**—The treatment consists of proper paring of the foot and proper shoeing.

### Quittor.

Quittor consists in a necrosis of the lateral cartilage. This is brought about by a para-chondral phlegmon, a suppurative phlegmon of this region of the foot, suppurative podotrochlititis, suppurative corns, treads on the coronet, nail puncture and ecidema.

**Cause**—Suppurative corns cause quittor by the spread of the inflammatory process to the cartilage. Quittor nearly always makes its appearance on the inside of the foot, and corns also make their appearance in this region. Treads on the coronet cause quittor in this way also, or the infection is brought in direct contact with the cartilage itself.

**Symptoms**—The first symptom noticed is a para-chondral phlegmon, which is a firm painful swelling around the coronary band. Then there is a small opening which forms in the region of the heel, and discharges a thin pus. This opening is usually small, round and contains abnormal granulations at its opening. There may develop several openings after the disease has run for several weeks. These fistulous canals may heal leaving behind them an unsightly cicatrix, which causes a deformity



in the wall of the foot. When the case is in the early stages there is lameness, but after it becomes chronic lameness fails.

The cartilage becomes green in color and the sequester is usually leaf form and covered with greyish or reddish granulations. This sequester may be free or partly attached to the cartilage. As a rule there is more than one necrotic spot on the cartilage. The fistulous canals may or may not be probed. They may be straight or bending.

**Prognosis**—The prognosis as a whole is somewhat unfavorable and should be made only with great care. Some quitters are easily curable while others are incurable.

**Treatment**—The main treatment consists in caustics and the radical operation which consists in resection of the lateral cartilage. Disinfection without caustics proves almost useless. Zinc chloride and formaldehyde seem to give the best results.

### Side Bones.

This is an ossification of the lateral cartilage. This condition is seen most commonly in heavy horses. This ossification occurs as the result of a chronic osteitis of the os pedis or a traumatic inflammation of the lateral cartilage or a primary chondritis.

**Cause**—The cause of these conditions is a constant irritation produced by hard usage on paved streets. Any abnormality of the foot acts as a predisposing factor. Usually side bones and splints develop at the same time.

**Symptoms**—Side bones do not give rise to any inflammatory condition after they have formed. During the process of formation they may give rise to an acute inflammatory lameness. This lameness is typical supporting leg lameness, which gets worse on motion and better after a long period of rest. If there is any lameness present after the side bones have been

formed, it is due to a contusing of the soft parts of the foot as a result of the non-elasticity of the cartilages. The most common complication is a peri-arthritis with the podo-arthritis.

**Treatment**—The treatment of side bones is practically worthless. In the acute stages while it is undergoing ossification, blistering agents may be used as well as actual cautery to hasten the process of ossification. Along with this a long period of rest is necessary. The period of rest is probably the most important thing in the treatment and other things are secondary. Shoeing with plates is also a very important factor, or shoeing so as to relieve the pressure on the quarter will also give relief.

### Thrush.

Ordinarily thrush consists in gangrene of the horny frog. This gangrenous process may extend to the heels and eventually on to the skin giving rise to symptoms of scratches.

**Symptoms**—The symptoms of thrush are tenderness in the gait and eventually lameness with a very foul discharge from the clefts of the frog and heels. This condition may result in an entire disintegration of the frog.

**Treatment**—The treatment consists of drying agents and antiseptics. Calomel powdered into the clefts and then bandaged is quite satisfactory. Formalin is probably the most satisfactory agent, as this dries and hardens at the same time. Some authorities advocate the use of coal tar antiseptics and muriatic acid. However, these are not as satisfactory.

## CHAPTER VII

### SURGICAL DIAGNOSIS

#### History.

**T**HE history of the case is obtained either from the owner or from the person having charge of the animal. The history of the case is just as important for a surgical diagnosis as for any other diagnosis. A careful anamnesis is half a diagnosis in surgery. The most important questions to be asked are: 1. The cause of this lesion. 2. Length of duration. 3. What has been the previous treatment? 4. How did it happen? 5. In case the animal is lame, where was this injury received, in the stall, on the street, in the blacksmith shop, etc. If the animal was injured on the street it is usually a nail puncture or a contusion. If the animal goes lame after leaving the blacksmith shop, you are inclined to think of nail prick. While these questions are being asked the affected parts should be palpated with the fingers. The diagnosis can usually be made by the history.

If a tumefaction is present and the history of the case indicates that it has arisen spontaneously and without apparent cause, a tumor may be suspected.

Next, the length of existence of this lesion. How long has the animal been affected? Has this lesion arisen suddenly or has it come on gradually? The answer to this question will designate whether it is acute, subacute or chronic.

A suddenly appearing lameness would indicate distortion, tendonitis, myositis or a fracture, or any complication of these four conditions.

If the lameness has been getting worse gradually and is practically chronic, it would indicate a spavin, ringbone, chronic podotrochlititis, or any complication of these conditions.

If the animal had received an injury in the region of the buttock and a suddenly appearing tumefaction has arisen it would indicate a hematoma or a complication of a hematoma. If this tumefaction was slow in developing it would indicate a phlegmon, an abscess or a new formation.

The next question that arises is, is this lameness constant or does it grow less or more severe on exercise? If the lameness is remittant, it must be rheumatic in origin, or a thrombus. If the lameness grows gradually better it would indicate a spavin. If the animal does not appear lame after a long period of rest, and then on exercise gradually the lameness appears, it would indicate the presence of ringbone, chronic gonitis, omarthrititis or podotrochlititis. If a condition exists that is the opposite to spavin lameness it would indicate the presence of distortion, or a complication of distortion.

By whom was the animal treated? If the treatment has been administered by the owner, a false diagnosis may have been made, and even then, a present diagnosis must be made.

### Examination.

Has a rectal examination been made? The special examination should first be made by making a general examination of the animal. Watch the animal move, take note of sex, age, color, general constitutional vigor and temperament. From a legal standpoint it is always advisable to make an exact memorandum of each examination.

In warm-blooded horses, especially in saddle horses, we find a degeneration of the bones and muscles, and when these animals are cast, they are subject to fractures.



In warm-blooded horses we see the disease which is known as roaring appearing most commonly. This is not noticed so much in phlegmatic horses.

Warm-blooded horses are more apt to become paralyzed after an operation than phlegmatic horses.

Cold-blooded animals are not as susceptible to chronic podotrochilitis.

Cold-blooded animals are more susceptible to the formation of side bones.

Warm-blooded animals are far more susceptible to tendinitis than cold-blooded animals.

In cold-blooded animals the perforans tendons are most commonly affected while in warm-blooded animals the perforatus or suspensory is most likely to be affected. Cryptorchidism appears most commonly in cross-bred and cold-blooded animals.

Horses are more susceptible to affections of tendon sheaths and joints than mules and donkeys.

Suppurative arthritis and tendo vaginitis seems to run a much milder course in mules than it does in horses.

### The Age of the Animal.

In diagnosing a tumefaction the age of the horse is a most important factor.

Old horses are very susceptible to carcinomatous and sarcomatous growths. Old horses suffer more from cataract than young horses, and are more susceptible to secondary hemorrhages than young horses. Fractures are more common in old horses than in young horses. Wounds heal more rapidly in young horses than in old horses. Old stallions are very apt to suffer from an adhesive periorchitis.

### Sex.

Stallions suffer most frequently from hernia. Every case of colic in a stallion should be looked upon with suspicion and

a thorough examination of the scrotum should be made for hernia. Geldings are more susceptible to calculi in the bladder than mares.

#### **Color.**

New formations in gray horses are usually melanotic in origin, especially in the region of the head and tail. Grey horses are very apt to become affected with diseases of the eye, especially those of the iris and crystalline lens. Animals having white skin are more subject to dermatitis and erythrema than those having a pigmented skin.

#### **Weight.**

The weight of the animal is important from a standpoint of dosage.

Large, heavy, fat horses are more apt to suffer from myositis, haemoglobinaemia and azoturia than smaller and thinner horses.

Very heavy horses are more apt to suffer from a sinking of the os pedis.

#### **Constitution.**

The general constitution of the animal influences wound healing.

The temperament must always be considered before an operation. Phlegmatic horses can usually be operated on in the standing position. Warm-blooded horses must be cast as a general rule.

#### **Inspection.**

This is carried on with the hands and the eyes. The first thing is to locate the diseased condition. This should then be compared with the opposite part of the body. The size, form, color and general condition of the lesion are the points to be considered. In considering the individual part, first locate the

topographical anatomy of that part. If the topographical anatomy of the part is understood a diagnosis can be made easily. The exact place, position and location of the lesion must be ascertained.

The size of the lesion is to be inspected. This size is important from a forensic standpoint and should be obtained by measuring with an accurate line. The form of the lesion inspected should be taken into account.

Wounds, cuts, new formation, etc., have a variety of forms. They may be round, oval, cylindrical, elliptical, or they may be compared with various objects. The color should also be taken into consideration, especially of wounds of the skin and mucous membrane. In certain forms of ulcerations a cancer can be diagnosed very often by the color of the exudate.

A suppurative nasal discharge usually indicates empyema; a greenish nasal discharge, which is foul smelling, generally indicates necrosis. The internal administration of various drugs will often change the color of the natural secretion.

The skin over an abscess that has become necrotic is bluish in color and this may be looked upon as a diagnostic symptom.

Necrosis of the skin is usually black, brown or lead color, while necrosis of the living tissue is yellowish in color or a light green. This is especially true of fistula, necrosis of the tendon, and necrosis of the pododerm. (These do not vary a great deal.) The antiseptic agent used may change the color of the exudate. A brownish color may be obtained by using iodine; a yellowish color is obtained by cantharides, etc.

A wound should be examined externally in regard to the condition of granulation tissue, whether it is deficient, excessive, or abnormal in any other respect. The surface of the wound may be covered with blood, lymph, pus or a slimy exudate.

### Healing by First Intention.

This is the immediate agglutination of a wound surface without suppuration. To have this, the edges of the wound must be brought in direct apposition, the entire wound must be entirely aseptic, all foreign bodies must be removed.

### Healing by Second Intention.

Healing by second intention is healing by excessive granulation and suppuration.

The properties of granulation tissue (why granulation tissue forms).

To make up for the loss of substance, to mechanically seal the lymph vessels and to protect the blood stream from the absorption of bacteria and their toxins.

### Palpation.

Palpation consists in manipulating the part by the hand to ascertain the temperature, the consistency, the motion, the compressibility and whether or not there is any crepitation present.

The probang may be used as a special means of palpation, and the catheter to examine the nasal cavities.

### Temperature.

The temperature of the affected part is obtained by laying the hand on the part. An elevation of temperature in a part would indicate an acute inflammatory process, while a sub-normal temperature would indicate necrosis or anaemia. Abscesses, phlegmon and dermatitis are usually accompanied by an elevation of temperature. The so-called cold abscess is not accompanied by acute inflammatory symptoms.



### Sensibility.

Sensation in the part is determined by pressure or pin prick, an increased sensation in a part indicates an inflammatory condition. The lessening of the normal sensation indicates necrosis or a paralysis of the peripheral or spinal nerves. Increased sensation can be located by pressing, bending, stretching, abduction, or rotation. In chronic arthritis, ringbone, and spavin diagnostic palpation is of no importance. For these diseases there is a special variety of palpation.

### Consistency.

As to the consistency of a new formation, note whether it is solid, firm, soft, flexible, hard or immovable. The consistency of a new formation may vary from a watery exudate to a firm cheese-like mass. Fluctuation is a diagnostic symptom in abscess, hematoma and hydrops. Pseudo-fluctuation of false fluctuation may be noticed in various forms of soft cancerous growths, especially in carcinoma. A stagnation oedema should not be confused with fluctuation. In stagnation oedema finger prints can be noticed in the swelling (pitting on pressure, diagnostic symptoms).

### Crepitation.

Crepitation is determined by palpation and is a peculiar rubbing or grinding sensation which is felt in the tissues. Crepitation usually indicates a fracture of a bone and is determined by manipulating the leg manually, moving the animal back and forth, or by rotating. Crepitation can also be heard as well as felt. Pseudo-crepitation or false crepitation sounds like the crunching of a snow ball, and usually designates fibrinous arthritis, fibrous bursitis, or fibrous tendovaginitis. It also appears in chronic gonitis and in an organizing hematoma. This pseudo-crepitation is not hard and rough like the

crepitation of bone but sounds something like crepitation of bone. In emphysema the crepitation sounds like crushing paper under the coat. It is noticed in septic emphysema and gas phlegmon (malignant oedema, black leg). This form of emphysema is soft and may be compared to pressing a feather and is due to the formation of gas in the subcutaneous tissue. It may be distinguished from bone crepitation because it is on the surface. Crepitation must be further distinguished from compression of a new formation.

#### **Abnormal Movement.**

Abnormal movement of a part may be seen as well as felt. Abnormal movement of a leg usually indicates fracture, luxation, subluxation, rupture of a tendon or muscle. Abnormal motion of the tail, penis, ears and tongue are usually due to some nervous derangement causing paralysis.

#### **Compressibility.**

Every new formation should be examined for compressibility by exerting pressure on the part. It may be either partially or momentarily compressible. Compressibility of a new formation or tumefaction usually indicates a hernia. Compressibility must be distinguished from pressure. An oedematous condition may be compressed but will not return to normal when the pressure is released.

#### **Pulsation.**

Pulsation and increased pulsation in a part usually indicate an acute inflammatory process. Certain tumors pulsate (angioma, goitre if it contains aneurism) and an aneurism can be located by pulsation.

#### **Probing.**

The reason for probing is to find the depth, position, edges, as well as direction of a wound or fistulous canal. The most

useful thing is the finger, and various other things as metal probe, catheter, soft probe and teat tube are used. Probing is indicated in fistula, quittor, scirrhus cord, bone fistula, fistula of the withers, all deep wounds, especially of the musculature, nail wounds, pricks, treads on coronet or any suppurative condition of the foot.

Special forms of probes for probing are the probang for the oesophagus, the catheter for the urethra, the teat tube for the teat canal, the milk fever apparatus for the lachrymal duct.

Probing is contra-indicated in fresh or newly-made perforating wounds, of tendon sheaths, wounds in the region of the abdomen, the thorax and is not necessary in shallow wounds. Perforating wounds into a body cavity should never be probed under any circumstances. Probing is also contra-indicated in suppurative perforations of joints, tendon sheaths, the abdomen or the thoracic cavity. Body cavities should not be probed because a new canal or a new phlegmon might be started or a wound which is not perforating may be made perforating.

#### **Percussion.**

Surgical percussion is brought about with a surgical percussion hammer, a blacksmith's hammer or the fingers. Emphysema, hydrops, as well as new formations of the sinuses may be located by percussion. If any of these conditions are present their will be a tympanitic tone present on percussion. Percussion of a hernia also has a tympanitic tone. In cases of pneumo-thorax, perforating chest wounds and sometimes fracture of the ribs, etc., a tympanitic tone may be heard on percussion.

#### **Ausculation.**

Crepitation of a fracture may be auscultated or it may be heard more easily than it can be felt. By auscultation the stenotic tone will determine whether the stenosis is present at

the nose, trachea, bronchial tubes or larynx. In a hernia also the peristaltic movement can be heard. In otorrhoea a sound will be heard on palpation which sounds like the crunching of a snowball. Very frequently after castration a peculiar gurgling sound may be heard, caused by air entering the abdominal cavity. This is of no consequence and should be looked on as harmless.

## DIAGNOSTIC OPERATIONS.

### Puncture.

Puncture is indicated if a tumefaction cannot be definitely diagnosed. A horse trocar may be inserted into the tumefaction to examine the contents and is absolutely a harmless operation if aseptically performed. This is used to differentiate between an abscess and a hematoma, empyema of a tendon sheath, empyema of a joint, empyema of a guttural pouch, hernia or hydrocele.

### Cocaine Injections.

Subcutaneous cocaine injections are used to temporarily relieve lameness for the sake of diagnosis, in navicular disease, articular ringbone, peri-articular ringbone, spavin and such diseases. Cocaine injection is a very valuable prognostic agent before neurectomy and should always be used before the operation is performed, although in some cases the results of a cocaine injection are negative while the operation itself will give positive results.

### Trepanation.

Trepanation and exploring is always done with a small automatic drill to locate new formations, hydrops, empyema, etc. Trepanning should also be resorted to in examining the nasal cavity for new formations, foreign bodies, etc.



### Extirpation.

Extirpation of a maxillary lymph gland is of diagnostic value, when the diseased process in the region of the head is due to glanders, secondary sarcoma, botryomycosis, actinomycosis and corcinoma of the nasal cavity or the sinuses.

### Resection.

Resection of the perforans tendon should be resorted to, to diagnose necrosis of the perforans tendon, suppurative podarthritis, suppurative arthritis, as well as fracture of the bones of the foot. These conditions are usually the result of nail puncture.

### Special Diagnosis of the Eye.

In making an examination of the eye, use a mirror and some diagnostic medicinal agent as atropine. In making a diagnosis, use three to five drops of a three per cent solution of atropine fifteen minutes before examination.

The lids are examined from the outside in.

### Eyelid.

If the eyelids are closed, it indicates a fear of light (photophobia). This is seen as a symptom in all painful affections of the eye. Photophobia would indicate the presence of conjunctivitis, keratitis, iritis, periodical ophthalmia, or foreign bodies under the lid. A painless drooping of the upper lid indicates paralysis. This is commonly known as ptosis and accompanies facial paralysis. If the eyelids are abnormally wide apart it may indicate a prolapse of the bulb or hydrophthalmus. Swelling of the eyelids usually indicates blepharitis, conjunctivitis, phlegmon, new formations, as well as suppurative panophthalmia. If the lids are abnormally thin with an increase in the folds it would indicate atrophy of the bulb.

If the edge of the eyelid along with the hair is turned inward or against the cornea, it indicates the presence of entropion (inversion of the eyelid). If we have the edges of the eyelid turned out, it indicates the presence of ectopion (eversion of the eyelids).

The discharge from the eye is very diagnostic. A serous discharge from the eye is noticed in all painful affections of the eye, as catarrhal conjunctivitis, foreign bodies, in the closing of the lachrymal duct, and in the first stages of distemper and moonblindness. The discharge from the eye assumes the nature of mucous in catarrhal conditions of the lid. The discharge from the eye becomes suppurative in purulent keratitis, purulent conjunctivitis, foreign bodies and in the second stage of distemper and moon eye. The discharge from the eye would be bloody in an injury to the lid. A chronic thickening of the eyelids would indicate eczema, phlegmon, necrosis, new formation or furunculosis.

### Conjunctiva.

The inspection of the conjunctiva is usually done by turning the lid inside out, and passing the finger around the conjunctival sack. An abnormal redness indicates acute conjunctivitis. If the vessels of the conjunctiva are congested, this is diagnostic of acute keratitis, cyclitis or panopthalmia. A paleness or yellowness indicates a catarrhal or a chronic suppurative conjunctivitis. In parenchymatous and phlegmonous conjunctivitis there is an extreme thickening and swelling of the conjunctiva. An enlargement or thickening of the lymph follicles assuming the form of granulation tissue is characteristic or follicular conjunctivitis.

The membrane nictitans is examined either by passing the finger around it, or pulling it out with a pincette.

The lachrymal sack and lachrymal duct may be examined by probing.

### **Bulb.**

An atrophy or a shrinking of the bulb is diagnosed by the fact that the bulb becomes soft in consistency and the eyelids become wrinkled and this condition can only be diagnosed positively by comparison. This indicates moon blindness or a congenital microphthalmus (one eye smaller than the other). An enlargement of the bulb would indicate retro-bulbary phlegmon, exophthalmus (protusion of the eyeballs), hydropthalmus, new formations, strabismus (squint), nystagmus (continual movement of one eye).

### **Cornea.**

Any inflammatory condition of the cornea causes it to become opaque. A roughness, a bluish discoloration, grayish or whitish discoloration, or the color of smoke indicates the presence of parenchymatous keratitis. If any of these conditions should become chronic it would indicate the presence of a leucoma. A yellowish discoloration indicates the presence of a suppurative keratitis. A brownish or black spot on the cornea indicates that there has been an ulcer there and this is the cicatrix.

Infections of the cornea may be superficial or deep. Normally the cornea is smooth and reflects somewhat like a mirror, instead of this superficial inflammation of the cornea, it becomes rough and uneven, opaque and in some cases milky. In deeper affections of the cornea it is usually swollen and symmetrical in shape.

### **Anterior Chamber of the Eye.**

In cases of iritis the anterior chamber contains flakes of fibrin. This usually indicates the presence of periodical ophthalmia. It may contain greenish pus; this would indicate suppuration. In iritis and suppurative cyclitis it may contain

a bloody or a fibro hemorrhagic exudate. This would also indicate the presence of periodical ophthalmia. A shrinking or an atrophy of the anterior chamber indicates the presence of chronic periodical ophthalmia or anterior synechia. An enlargement of the anterior chamber of the eye indicates the presence of luxation of the lens or the formation of posterior synechia, or hydrophthalmus.

### The Iris and the Pupil.

The color, movement and general structure must be considered. The color is black except in animals that have no pigment in the eye. A reddish or greyish discoloration of the iris indicates the presence of iritis. In iritis the iris is also swollen and covered with a fibrous exudate. A visible vascularization indicates the presence of acute iritis or periodical ophthalmia. In chronic iritis the iris becomes flabby and shrunken.

If the iris becomes adherent to the lens it indicates posterior synechia, this is usually seen to accompany periodical ophthalmia.

In the examination of the pupil, the size and the evenness of the edges are to be taken into consideration. If the edge becomes very ragged it is an indication of periodical ophthalmia. The pupil becomes narrow as the result of any painful affection of the eye. Also in an acute and chronic iritis chronic narrowing of the pupil is seen. Retinitis, meningitis and various drugs may have this same effect.

An abnormal dilation of the pupil which becomes chronic, indicates a paralysis of the retina and optic nerve. A paralysis of the retina is also seen in diseases of the brain, in a paralysis of the outer motor apparatus of the eye, in various poisonings, and in certain infectious and contagious diseases. There are certain medicinal agents that also affect the eye causing this same condition. The pupil becomes immovable and does not



respond to light in certain nervous conditions such as iritis, cykritis and moon eye.

### Posterior Chamber of the Eye.

By the posterior chamber of the eye is meant the space between the retina, the lens, ciliary bodies and iris.

To discover the presence of iritis and cykritis, the examination of the posterior chamber of the eye is very advantageous.

In chronic cykritis there is a form of posterior synechia which indicates the presence of moon blindness. The examination of the posterior chamber of the eye is impossible without the use of atropine.

### Lens.

The lens is examined for opacity and abnormal positions.

To examine the lens properly it is necessary to use the head mirror and light.

Chronic opacity of the lens may be any color or shape and indicates the presence of a cataract.

A luxation or subluxation of the lens may take place in either the posterior or anterior chamber of the eye.

### Retina.

The retina is examined by the use of the head mirror only. The retina may become opaque, cloudy and pale as a result of paralysis or malnutrition.

A loosening of the retina indicates a paralysis of the nerve, the presence of retinitis or an atrophic condition of the papilla.

An atrophic condition of the papilla is diagnosed by the fact that the papilla becomes small, greenish, pale and has the appearance of being cut off square.

In amaurosis the ciliary bodies become opaque and almost invisible.

### Examination of the Pupil and Lens with the Mirror.

Small opacities in the lens are recognized as dark or immovable spots. The darker and larger the cataract the darker and denser it will appear by condensing light upon it. If the entire lens is opaque it is impossible for light to pass to the posterior part of the eye. Small circumscribed opacities on the posterior surface of the lens have the appearance of a cloud or shadow.

From a forensic standpoint it is quite necessary that the spot or cataract be located definitely.

If atropine is injected into the eye the entire lens may be readily examined.

A complete opacity will act as a mirror and reflect light. An opacity of the lens must be differentiated from a floating body in the posterior chamber of the eye.

### Palpation of the Eyeball.

The eyeball is palpated to locate a rise in temperature and to ascertain its consistency. The consistency would either be more firm or softer than normal. If the consistency is softer it indicates an atrophic condition of the bulb. If the consistency is more firm than normal it would indicate hydrophthalmia.

The most common diagnostic agents are a four per cent solution of cocaine to allay the pain followed by five drops of a five per cent solution of atropine.

## EXAMINATION OF THE SINUSES AND NASAL CAVITY.

### Inspection.

First examine the nasal discharge, to determine whether it is unilateral or bilateral. Then the discharge itself for consistency, color and quantity.

If the consistency of the nasal discharge is catarrhal or muco-purulent it indicates the presence of a catarrhal or suppurative inflammation in the nasal cavities or sinuses, fracture or new formations.

If this discharge is discharged in varying quantities it is indicative of empyema of the sinuses or guttural pouches.

A nasal discharge that is mixed with blood would indicate the presence of adeno-fibroma, adeno-hyperplasia, angioma, glanders or fracture. The odor of the discharge is quite diagnostic. A sort of a sweetish, fetid odor indicates the presence of necrosis. A very offensive odor indicates caries of the teeth.

A swelling in the region of the false nostril would be caused by phlegmon, malignant oedema, petechial fever and glanders.

A swelling in the region of the nasal, frontal or maxillary bones would indicate the presence of phlegmon, fracture, periostitis, empyema of the sinuses or new formations in the sinuses.

There is another form of swelling which appears in this region and that is a congenital malformation due to rhachitis, or osteo malacia. This generally appears in young animals and is most commonly bilateral and must be distinguished from empyema. Fistula in this region may indicate that the animal has been trephined and has not healed, or the presence of a compound fracture.

Examination of the nasal mucous membrane should be made for color, consistency, as to ulceration, erosion or polypi on its surface.

The upper part of the nasal cavity is hard to examine in the horse, and can only be made by reflection or probing with a horse catheter. With a catheter, tumefaction, painful swellings, abscesses and hydrops can usually be located.

Ascertain whether the skin is movable or not over the external swelling. If the skin is immovable it indicates the

presence of phlegmon or fistula. If the skin is abnormally loose it indicates an impression.

The most common form of tumefaction which appears in the nasal cavity is polypus. A polypus must be differentiated from a foreign body. A thickening of the upper part of the nasal cavity indicates a tumor of some kind. A thickening in the lower third of the nasal cavity indicates a hyperplastic inflammation of the mucous membrane.

The exhaled air should be examined first for temperature and then for absence. The absence of exhaled air from one nostril indicates the presence of stenosis, or a stenotic condition of some kind.

It is also necessary to examine the submaxillary lymph gland to make a diagnosis. The lymph glands are examined as to size, consistency, movability, whether they are painless, painful, or adherent to the connective tissue surrounding them. If the lymph glands are enlarged and painless on one side it indicates the presence of sarcoma or carcinoma. Empyema is diagnosed by the lymph glands being painful and swollen on the affected side.

**Percussion**—Percussion of the sinuses is used to locate a new formation, empyema, or hydrops of the sinuses. If on percussion there is a peculiar resonant sound it indicates the presence of empyema or hydrops. This must not be confused with a thickening of the bone as a result of rachitis.

**Ausculation**—Ausculation is of advantage only to locate stenosis.

#### Examination of the Mouth Cavity.

For examination of the mouth cavity a speculum must be used.

First inspect the lips and cheeks, examine for wounds, eczema, phlegmon, new formations and paralysis.

Also inspect the saliva as to whether or not it contains pus. If it contains pus it indicates the presence of wounds,



ulceration of the mucous membrane, necrosis of the mucous membrane of the mouth, tongue or pharynx. A foul smelling discharge from the buccal cavity usually indicates a foreign body or caries.

The teeth should be examined for a number of things. The bite; this may be shear mouth or step mouth, there may be teeth absent, there may be long or short teeth, there may be caries, necrotic teeth or alveolar periostitis.

The lower jaw should be examined for bit pressure, necrosis, deformity, exostosis and fistula.

If the animal eats slowly and carefully it usually indicates a lesion in the mouth cavity. Excessive salivation usually indicates diseases of the teeth, stomatitis, glossitis or foreign bodies.

### Examination of the Neck.

Examination of the neck is done mainly by palpation and inspection.

The neck is examined for wounds, fistula, glanders, abscesses, poll evil, phlegmon, goiter, or an abnormal condition.

By means of palpation the temperature and painfulness of the swelling may be ascertained.

Puncture may be resorted to in cases of swellings that are hard to diagnose.

The most common condition found in the region of the parotid gland is a firm hard swelling. This indicates the presence of a sub-parotid abscess or an abscess in the guttural pouch. Empyema of the guttural pouch is diagnosed by a doughy, fluctuating painless tumefaction in the region of the parotid.

Examination of the larynx is carried out mainly by palpation and exploration.

Palpation of the larynx would reveal the presence of oedema, partial paralysis, inflammation or the formation of a

tumor. Palpation of the larynx will usually locate a unilateral or a partial paralysis as is seen in roaring.

The trachea is examined for stenosis, ossification of fracture.

The oesophagus is examined for stenosis, diverticulum, rupture, difficult deglutition, or for regurgitation of food. The exact diagnosis can only be made by the use of a probe or probang.

### Examination of the Thorax.

The breast is examined for wounds, fistula, phlegmon and new formations.

By palpating a new formation the presence of an abscess can be located.

A sternal fistula should always be probed to locate its direction and size.

The foreflank should be examined for accidental perforating wounds, superficial wounds, circumscribed and diffuse swellings. A diffuse swelling usually indicates the presence of a phlegmon or fractured rib. Also examine the foreflank for fistula and new formations.

By palpating the consistency can be determined.

An abscess is a circumscribed accumulation of pus within the tissue and presents the following symptoms: A circumscribed swelling which is hot and painful. The skin is tense and immovable, very hard at the periphery and softer in the center.

A hematoma is a hemorrhage into the connective tissue and may be diffuse or circumscribed. It presents the following symptoms: It is cold, painless and fluctuates over its entire area and the skin is movable over all its parts and it may terminate by encapsulation, while an abscess generally points but may encapsulate.

A suppurative phlegmon is a diffuse suppurative inflammation of the connective tissue, which gives rise to a diffuse

firm swelling, which is the same consistency over its entire surface. This usually leads to a fistula and suppuration.

The witness should be examined for fistulae. Fistulae in the region of the withers must be differentiated from hemotoma, subcutaneous abscesses and pressure necrosis from the harness. A diffuse suppurative phlegmon in the region of the withers usually has an unfavorable prognosis.

### Special Examination for Lameness.

Lameness is any disturbance of normal motion.

In a general way lameness is due to three things. First, painful inflammatory conditions; second, any mechanical hindrance to motion, and third, a paralysis of the nerve or muscle. Painful inflammatory conditions includes arthritis, distortion, contusion, luxation, myositis, muscle rupture, tendonitis, tendovaginitis, bursitis, fracture, periostitis, osteitis, neuritis, neuroma, pododermatitis, dermatitis, phlegmon, etc. Mechanical hindrance to motion includes contraction, exostosis, ankylosis, stiltfoot, ringbone and spavin. The most common forms of paralysis, are paralysis of the prescapular, of the radial, of the crural and of the obturator nerves. The most common forms of muscular paralysis are paralysis of the arytenoids and paralysis of the quadriceps femoris.

Examine the animal to see if the lameness has appeared suddenly. Has the lameness appeared while the animal was in motion? Does the lameness interfere with motion? If so, is it a swinging leg lameness.

If the lameness interferes with supporting the weight it is supporting leg lameness.

If it interferes with flexion and extension it is called swinging leg lameness.

The lameness usually is classified with the part affected. If the lameness is above the carpus and tarsus it usually gives

rise to a swinging leg lameness. If below it gives rise to a supporting leg lameness.

According to the severity of the lesion there are three grades of lameness.

The most severe is known as a high grade lameness and indicates that the animal cannot place the leg on the ground.

A second or middle grade lameness indicates that the animal is able to place the toe of the affected part on the ground and support some weight. This is usually seen in distortion, podotrochlititis and nail puncture.

The third grade indicates that the animal is able to place the foot squarely on the ground but can only support the weight of the part for a short time.

Swinging leg lameness indicates either an impossibility or slowness of extension and flexion of the leg, or the step is very short and choppy. In swinging leg lameness nodding of the head is not very pronounced but becomes more severe in sand or on soft roads. Swinging leg lameness indicates that the lesion is either in the shoulder or the croup.

Supporting leg lameness is the most common form.

In supporting leg lameness the leg can be extended or flexed, normally, but the animal is unable to bear the weight of the body on it. Supporting leg lameness indicates a lesion in the foot, or one of the joints below the carpus, the tendon, or a fracture. In supporting leg lameness the step is very short and rapid.

A very suddenly appearing lameness is usually due to distortion, rupture of a muscle or a tendon, fracture or luxation.

**Diagnostic Cocaine Injection**—In doubtful cases and in cases where the lameness cannot be definitely located subcutaneous cocaine injections should be resorted to.

The injections should be made immediately over the course of the nerve. The cocaine injection should be made over the digital nerve first, then if the lameness subsides it indicates



the presence of the lesion below that part. The next injection should be made over the plantar; if the lameness subsides it shows that the lesion is at that point or below it. If the lameness does not cease the next injection should then be made over the median nerve. If the lameness ceases this indicates that the lesion is below that point. If the lameness still exists after making these injections, an injection should be made over the ulnar nerve. If the lameness subsides, the lesion is in the region of the carpus or flexor tendons.

Cocaine injections of the hind leg should be somewhat similar. The posterior tibial should be anaesthetized to locate lameness for ringbone, and the anterior tibial and posterior tibial should be anaesthetized for a spavin lameness.

To relieve the sensation around the face anaesthetize the trifacial nerve. A diagnostic cocaine injection should be made before neurectomy is performed. If the lameness is relieved the animal will make a good recovery following the operation. A very satisfactory solution for making these injections may be made as follows: Add ten grains each of cocaine and boric acid to an ounce of water, dissolve and use fifteen drops at each injection.

## SPECIAL EXAMINATION OF THE SHOULDER.

### Shoulder Lameness.

This particular kind of lameness is swinging leg lameness and generally indicates the presence of a diseased condition of the muscle, paralysis, a disease of rheumatic origin, an abscess or a new formation.

Atrophy of the shoulder muscles is not an indication of shoulder lameness except in very young animals when it may occur.

The shoulder should be examined for excessive heat, circumscribed painful areas or contusions. The consistency of these new formations would indicate their structure.

Abnormal motion in the part indicates a fracture.

If a rotating movement of the shoulder causes pain the lesion may be in the region of the shoulder joint.

Before diagnosing shoulder lameness a cocaine injection over the median nerve should be resorted to, to be sure it is not below that point.

### Examination of the Carpus.

The lameness which is shown by a lesion in the carpus is usually supporting leg lameness, but may be mixed lameness.

The carpus must be examined for swellings, these may be circumscribed or diffuse, or the lesion may involve the joint itself. Lesions involving the joint usually appear on the inner surface. A lesion or swelling entirely around the joint generally indicates the presence of chronic deforming arthritis or hydrops of the joint. A change of position or abnormal movement of the joint is very rare; if present it would indicate luxation or fracture.

The flow of synovia from a wound surrounding a joint indicates a puncture of a tendon sheath or the joint capsule.

By palpating the new formation in the region of the joint its consistency or origin can usually be determined.

### Examination of the Flexor Tendons.

The most common diseases which affect the flexor tendons are tendonitis and tendo-vaginitis. The lameness appears suddenly and is supporting leg lameness.

There may be a contraction of one of the tendons which can be readily felt and gives rise to the formation of stiltfoot. If the heel strikes the ground first and the toe is somewhat elevated, it indicates the presence of a rupture of the perforans tendon.

Swellings in the region of the tendon are usually diffuse but may be circumscribed. Circumscribed swellings indicate hydrops calluses, or tendovaginitis. These swellings should be palpated to determine a rise in temperature, painfulness and consistency. A difference must be made between tendonitis and tendovaginitis.

By palpation a rupture can usually be located.

### Examination of the Hoof.

Examination of the hoof is carried on by means of inspection, palpation, percussion, mensuration and by the examination of the digital pulse.

First see if the position of the foot is normal or abnormal. The reason for examining the position of the foot is the fact that the position will cause a faulty formation of the hoof.

The hoof should be examined for atrophy, this being very important from a legal standpoint.

The shoe should be examined; if the shoe is worn off too much in front it indicates the presence of spavin, chronic deforming gonitis or stiltfoot.

A pathological ring on the hoof is very thick and abrupt and usually diverges from the toe to the heel. Physiologically normal rings are of the same consistency around the foot and are usually due to a sudden change in the surrounding conditions. A partial ring formation is abnormal and generally indicates the presence of pododermatitis.

### Examination of the Sole.

Examine the sole of the foot to see if it is arched or flat, and if the white line is normal. A flat sole is generally the result of laminitis or pododermatitis. The sole should be examined for corns. Corns are contusions.

### Examination of the Frog.

A severe swelling or heat in the frog indicates the presence of a lesion in the fatty frog.

An atrophic condition of the frog indicates the presence of some chronic disease and is usually accompanied by an atrophic condition of the entire foot.

### Examination of the Coronary Band.

This should be examined for swelling, infectious processes and subcoronary phlegmon.

A sinking of the coronary band accompanies a sinking of the os pedis, with a flattening of the sole.

Fistulae, quittor, or keloids must be differentiated from warts in the region of the foot.

Keloids consist of an abnormal cicatrix which has become horny. As a rule this is due to an infection which affects the bulb or the heel.

A quittor may appear in the heel.

### Palpation of the Hoof.

The hoof is palpated by means of hoof tongs. These should be used to locate sensitiveness within the horny wall. In using a hoof tong one foot must be compared with the other because a good many horses with sound feet will flinch.

Acute infectious processes involving the foot are usually accompanied by heat.

Chronic lameness and fractures are generally cold.

Palpation of the foot may also be done by the thumb. By bringing undue pressure upon the bulb the animal may show pain which indicates the presence of navicular disease.

By passive movement, the leg being flexed, rotated, etc., arthritis, peri-arthritis and articular ringbone may be diagnosed,



also a side bone, that is if the new formation will give rise to pain by pressure or flexion, in this region.

#### **Percussion of the Hoof.**

The hoof is percussed with a hammer. Usually a blacksmith's hammer is used. Tapping must be gentle because a hard blow on a normal foot will cause pain.

By percussion a separation of the wall, or a chronic pododermatitis may be diagnosed.

#### **Mensuration.**

Measuring the foot is of great importance from a legal standpoint. This should be done with a wire or steel tape line.

The measuring should be done at the coronary band on the hoof, half way from the coronary band and sole, and on ground surface.

However mensuration cannot be relied upon unless the feet have been properly taken care of and properly pared.

The angle of the foot should be measured. The reason being to determine if the lesion is causing a mechanical faulty position of the limb.

#### **Examination of the Urinary Tract.**

Examination of the urinary tract is carried on by rectal examination of the bladder, urethra and examination of the urine itself.

The examination of the bladder per rectum would indicate painfulness, thickening or a distention.

The examination of the urethra is mainly for a stenosis or some foreign body.

The manner in which urine is voided normally is in a continuous stream.

There may also be a retention of the urine. This may be due to the urethra containing a foreign body, or there may be an accumulation of smegma at opening of urethra. It may also be due to new formations, strictures, paralysis of the bladder, or urethra.

The urine may be voided in drops, and if so it is nearly always due to a foreign body in the urethra.

An animal that voids urine without protruding the penis usually suffers from partial paralysis of the penis, stenosis or a foreign body in the urethra.

If the urine is of a light brown color it contains blood, if dark brown it indicates a hemorrhage of kidney; if light colored or fresh blood it indicates the hemorrhage has been in the bladder or urethra.

If the urine contains pus, it indicates the presence of ulcers in the bladder.

The urine may contain mucous, which indicates the presence of catarrh of the bladder.

If the urine is extremely foul smelling, it may indicate a new formation in the bladder.

### Examination of the Croup or Hind Quarter.

The croup or hind quarter is examined for atrophy or an asymmetrical condition.

An atrophy of certain parts of the hip is very diagnostic. An atrophy of the muscles of adduction and abduction is very diagnostic of spavin lameness. A serious atrophy in the gluteal region is very diagnostic of gonitis. An atrophic condition of the quadriceps femoris is diagnostic of a partial paralysis.

The outward examination of the hip consists of palpation to determine fluctuating areas, crepitation and abnormal movements. Increased sensibility, consistency and passive

movement of the hip are produced by rotating the limb, by flexion, extension, abduction and adduction.

Mensuration of the hip to determine the exact atrophic condition is of value only from a legal standpoint.

### **Rectal Examination.**

Rectal examination is done for a great many different purposes. To locate an abnormality of the spleen; to locate the testicle in cryptorchid; to locate inguinal or scrotal hernia; to examine the uterus for pregnancy or an abnormal condition; to examine the arteries passing through the pelvis (thrombosis); to examine the lymph glands in that region; to examine the rectum itself.

Examine the rectum for increased sensitiveness, swelling of the mucous membrane, foreign bodies, new formation, stenosis or diverticulum.

### **Examination for Prolapse of the Vagina.**

Examine the contents and inguinal ring per rectum. The internal inguinal ring in ridglings is usually covered with a layer of peritoneum. In case of flankers the cord may be felt passing through the opening. In case of a cryptorchid the testicle can usually be located a few inches forward from the internal inguinal ring. The testicle feels like a solid, somewhat egg-shaped circumscribed fluctuating body. The consistency is about that of a bag of mercury. In case of a hernia the loop of bowel may be felt passing through the ring.

### **Examination of the Hock Joint.**

The hock should be examined for abnormal position, new formations, malformation, hydrops, acute and chronic inflammatory processes, exostosis, suppurative phlegmon, chronic

deforming arthritis, for the consistency of any new formation as well as for abnormal movement.

From a legal standpoint it is always well to measure the hock.

Hydrops of the joint itself must not be confused with hydrops of the tendons sheaths. Hydrops of the joint is usually designated as "bog spavin" or "thoropin." Hydrops of a tendon sheath consists of a long, painless, fluctuating swelling.

The joint itself should be examined for congenital malformation which must not be confused with other lesions.

### PREScriptions.

For a resorbing agent in capped hock, thoropin, bog spavin, splints and bursal enlargements.

Recipe.

Iodine crystals.....	1 oz.
Ether .....	2 oz.
Alcohol .....	2 oz.
Flexible collodion.....	2 oz.

M. f. s.

Apply once daily for ten days with a brush, then grease and in ten days repeat. Repeat as often as necessary to get results.

For a blistering agent in splints, spavins and ring bones which are forming.

Recipe.

Iodine crystals.....	2 dr.
Potassium iodine.....	1 dr.
Red iodine of mercury.....	2 dr.
Alcohol .....	2 oz.

M. f. s.

Apply once daily with brush for three days, then grease and do not repeat under two weeks.



Escharotic paste for sloughing fistulous tracts as "poll evil," "quittor," "fistula of the withers," etc.

Recipe.

Zinc chloride.....	4 oz.
Water .....	1 oz.
Gum Arabic.....	1 oz.
Powdered blood root.....	4 oz.

Mix in order given and roll out into sticks and pack canal. If possible suture wound to keep packing in place. After seven days remove the slough and treat wound as an open wound.

Ointment for ring worm, eczema and skin diseases in dogs.

Recipe.

Calomel .....	1 dr.
Salicylic acid.....	20 grs.
Resorcin .....	20 grs.
Zinc oxide.....	1 dr.
Starch .....	2 drs.
Lanolin .....	$\frac{1}{2}$ oz.
Benzoated lard.....	$\frac{1}{2}$ oz.
M. f. ointment.	

Apply twice or three times daily to affected parts.

White liniment for general use.

Recipe.

One quart soft water.	
Six eggs.	
Acetic acid.....	8 oz.
Turpentine .....	16 oz.

Beat eggs thoroughly and add water. Shake well and add acetic acid slowly. Shake well again and add turpentine. Shake well daily for ten minutes for a week. Dilute for use.

Liquid blister for a general blistering agent.

Recipe.

Powdered euphorbia.....	2 oz.
Powdered cantharides.....	2 oz.
Oil of turpentine.....	8 oz.
Linseed oil.....	4 oz.

Mix and allow to stand ten days before using. Apply once daily for three days, for a severe blister.

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For wounds, chaps, scratches, calks and harness galls.

Recipe.

Tincture of arnica.....	2 oz.
Goulard's extract.....	2 oz.
Water .....	2 pints.

Apply two or three times daily; if possible apply cotton and a bandage to the part.

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Escharotic paste for sloughing actinomycomas, etc.

Recipe.

Zinc chloride.....	6 oz.
Water .....	$\frac{1}{2}$ oz.
Gum Arabic.....	1 oz.
Arsenic .....	2 oz.
Flour enough for consistency.	

Mix in order given and pack into the openings, allowing sloughing to take place.

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To remove the hair for operations.

Recipe.

Barium sulphate.....	3 oz.
Zinc sulphate.....	1 oz.
Starch .....	1 oz.

Add enough water to form a paste. Apply to the part, rub in well and allow to dry. After drying rub briskly and hair will come out.

## Healing ointment for general use.

## Recipe.

Creolin .....	1 dr.
Oleate of mercury.....	$\frac{1}{2}$ oz.
Zinc oxide.....	$\frac{1}{2}$ oz.
Salicylic acid.....	1 dr.
Vaseline .....	$1\frac{1}{2}$ oz.

M. f. ointment.

Apply two or three times daily to wound surface.

## Liniment for general use.

## Recipe.

Tincture of iodine.....	1 oz.
Chloroform .....	1 oz.
Tincture of belladonna.....	1 oz.
Tincture of camphor.....	2 oz.
Alcohol .....	4 oz.
Water .....	8 oz.

M. f. liniment.

For spavins, ring bones, splints, etc., which are just forming or which have not responded to firing.

## Recipe.

Hydrochloric acid.....	4 drs.
Bichloride of mercury.....	4 drs.
Alcohol .....	4 oz.

Camphor gum.....	2 oz.
Oil of turpentine.....	1 oz.
Alcohol .....	18 oz.

Mix separately, then mix the two parts.

Apply just enough to thoroughly moisten, then massage freely. Do not blister and if a blister is gotten grease and discontinue using it until blister has disappeared.

To keep flies away from a wound or a part of the body.

Recipe.

Fish oil.....	1 gal.
Oil of tar.....	1 pt.
Kerosene .....	1/2 gal.
Crude carbolic acid.....	2 pints.
M. f. s.	

Apply to the parts with a spray pump.

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Blistering ointment that will not leave a scar.

Recipe.

Powdered euphorbia.....	1 oz.
Powdered cantharides.....	1 oz.
Vaseline .....	4 oz.

Mix in a water bath. Apply once daily for three days then grease.

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Liniment for general use.

Recipe.

Tincture capsicum.....	4 oz.
Tincture myrrh.....	2 oz.
Alcohol .....	2 pints.
M. f. liniment.	

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Gall ointment for all classes of open wounds.

Recipe.

Vaseline .....	7 lbs.
Paraffin .....	8 oz.
Oil of turpentine.....	8 oz.
Venice turpentine.....	6 oz.
Formalin .....	2 1/2 oz.
Verdegris .....	1 oz.

Mix and allow to stand in a water bath until thoroughly mixed.



Liniment for general use.

Recipe.

Sulphuric acid.....	4 oz.
Potassium nitrate.....	4 oz.
Ammonium chloride.....	4 oz.
Oil origanum.....	4 oz.
Vinegar .....	4 pints.

Mix the constituents except the sulphuric acid, then add this gradually.

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For scratches.

Recipe.

Chromic acid.....	1 oz.
Water .....	8 oz.
M. f. solution.	

Apply twice daily.

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Blistering Balsam.

Recipe.

Powdered cantharides.....	2 oz.
Powdered euphorbia.....	1 oz.
Alcohol (denatured).....	1 pint

Mix, allow to stand for ten days, then filter. Apply with a brush.

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Sweating Blister.

Recipe.

Oil of spike.....	1 oz.
Oil of hemlock.....	1 oz.
Tincture cantharides.....	2 oz.
Alcohol .....	8 oz.

Mix, bathe the parts with warm water, then apply blister and bandage loosely.

Gall ointment for harness galls and collar bruises.

Recipe.

Zinc oxide.....	1 lb.
Calcium oxide.....	1 lb.
Venice turpentine.....	2 oz.
Vaseline .....	2 lb.

Mix in a water bath. \_\_\_\_\_

Dusting powder to be used on wound surfaces.

Recipe.

Powdered zinc oxide.....	8 oz.
Slacked lime.....	8 oz.
Powdered alum.....	4 oz.

Mix thoroughly and apply through a sprinkle top can.

Dusting powder.

Recipe.

Tannin.	
Powdered alum.	
Boric acid.....	equal parts.

Mix thoroughly and apply as above.

Dusting powder.

Recipe.

Powdered willow charcoal.....	8 oz.
Zinc oxide.....	8 oz.
Naphthaline .....	8 oz.

Mix thoroughly and apply as above.

Dusting powder.

Recipe.

Iodoform .....	1 oz.
Tannin .....	4 oz.
Powdered sugar.....	4 oz.

Mix thoroughly and apply as above.

## Wound Varnish.

## Recipe.

Bichloride of mercury, 1 to 1000 solution.

Gelatin, as much as the above will dissolve.

When the gelatin is dissolved add ten per cent glycerine.

## Wound Varnish.

## Recipe.

Zinc oxide.....50 parts.

Water .....50 parts.

Zinc chloride..... 5 parts.

Mix.

**A SIMPLE METHOD FOR MAKING AUTOGENIC BACTERINS.**

Take one-half ounce of pus from the wound, add to this five ounces of normal saline solution. Place in a bottle, then in a double boiler and incubate for three to four hours at a temperature of 140 degrees F. Next filter or strain through a clean cloth, then add five drops of phenol to each ounce. The first injection should be 5 cc, if this dose is too great a reaction will be shown by an increase in the discharge from the wound. If the reaction occurs inject 3 cc. in five days and inject a sufficient amount every five days to reach the point of reaction.



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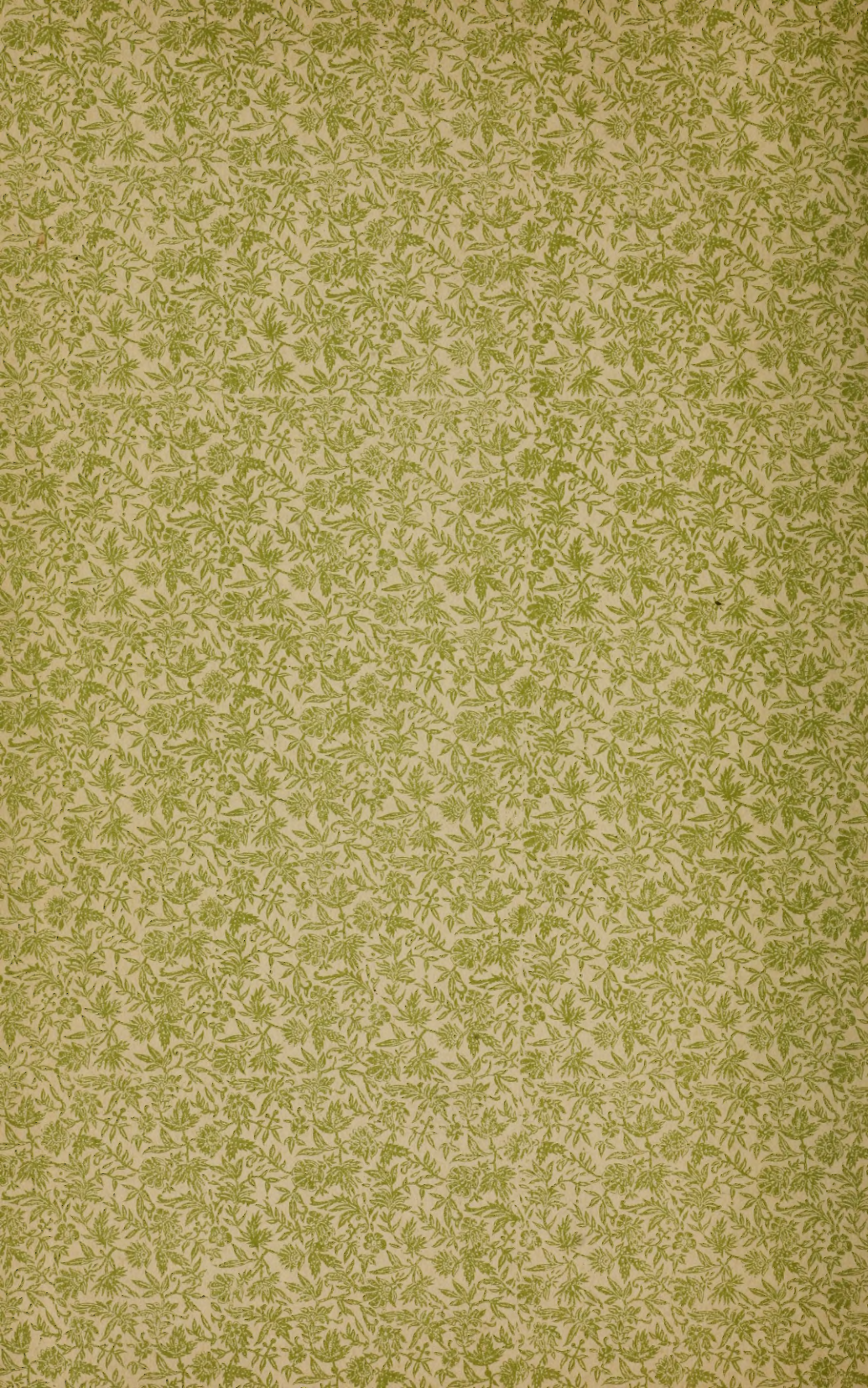


















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